

**DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR**

**PROJECT TITLE: CONSTRUCTION OF (WTP) LAW VITRIFICATION PLANT**

**Emission Unit Name: LV-S2**

**Emission Unit ID 550**

This is a MINOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: **BARCT**

ALARACT [WAC 246-247-040(4)]

BARCT [WAC 246-247-040(3)]

<b>Zone or Area:</b>	<b>Abatement Technology</b>	<b>Required # of Units</b>	<b>Additional Description/Conditions</b>
	HEPA	2	Two stages of HEPA filtration. A total of ten banks of primary HEPAs nine in operation and one in standby. Each bank contains four filters. A total ten banks of secondary HEPAs nine in operation and one in standby. Each bank contains four filters.
	Exhaust Fan	2	One in operation and one in standby

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

<b>Federal and State Regulatory</b>	<b>Monitoring and Testing Procedure</b>	<b>Radionuclides Requiring Measurement</b>	<b>Sampling Frequency</b>
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Am-241 and Sr-90	Continuous

**Sampling Requirements:** Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with some typographical changes, AIR 03-1014, mailed on October 23, 2003.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.
- 3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

- 3) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:  
the receipt of low-activity waste feed from the Pretreatment Facility and conversion of the waste slurry and glass formers into molten glass. See process descriptions listed below for the individual emission units.
- 4) This NOC does not have "Annual Possession Quantity" limits.
- 5) The WDOH has determined that BARCT for emission unit LV-S2 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: two stages of High-Efficiency Particulate Air (HEPA) filtration, and Exhaust Fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

Space temperatures from which CS air is exhausted shall be measured as the inlet airstream temperature for each HEPA filter bank by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication. The CSV exhaust air stream temperature shall at all times be above the dewpoint, therefore Relative Humidity (RH) for this emission unit shall not be a required HEPA operating parameter nor shall an indication device be required. Should design or operations change in such a way that RH becomes a key operating parameter for the HEPA banks of this emission unit, an indication device shall be required prior to implementing the change.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

- 6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to the following:
- LAW melter shell (LSM) or enclosure;
  - removal of consumables (bubbler assemblies, refractory thermocouples, airlifts, level detectors, feed nozzles, and film coolers) from the melter within the LSM gallery;
  - bubbler shearing and other consumable size reduction;
  - filling of consumable waste drums;
  - LAW melter feed system;
  - LAW container handling system; and
  - Carbon dioxide blasting for immobilized glass container decontamination and monitoring;
  - Sealing of filled ILAW canisters.

Detailed descriptions of activities in the areas ventilated by this emission unit will be provided to WDOH prior to cold commissioning. The WDOH reserves the right to determine if changes in this process description constitute a significant modification under WAC 246-247-030 (16) & (25). [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

- 7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]
- 8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110 (10,11,12,13,14,15)]
- 9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110 (5)]
- 10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040 (3) & (4)]
- 11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040 (3) & (4)]
- 12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput. Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040 (3)]
- 13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to

the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

- 14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]
- 15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]
- 16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6)WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]
- 17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10).
- 18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]
- 19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]
- 20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]
- 21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]
- 22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]
- 23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]
- 24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]
- 25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). [WAC 246-247(6) and (8)]

- 26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]
- 27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]
- 28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]
- 29) (a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the WDOH Code Compliance Matrix for LAW HVAC System, 24590-WTP-RPT-ENG-02-001, Rev. A, dated November 15, 2002". [WAC 246-247-120]  
  
(b) Emission unit components design, construction, testing, and operation different from those identified in WDOH Code Compliance Matrix for LAW HVAC System, 24590-WTP-RPT-ENG-02-001, Rev. A, dated November 15, 2002" are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]  
  
(c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]  
  
(d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]
- 30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the applicable standards the WDOH Code Compliance Matrix for LAW HVAC System, 24590-WTP-RPT-ENG-02-001, Rev. A, dated November 15, 2002" shall be made available

for review and approval by WDOH: HEPA filter housing, exhaust fans, dampers, ductwork, and indication devices. [WAC 246-247-120]

- 31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]
- 32) The annual ILAW production from the LAW plant shall not exceed 1.825 E4 metric tons/year, based on glass as the waste form. [WAC 246-247-030(5); WAC 246-47-110 (10)]
- 33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]
- 34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]
- 35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank. The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]
- 36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]
- 37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080 (7)]
- 38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall provide critical operating parameters; develop acceptable operating ranges; develop operating procedures to monitor and maintain these parameters; provide descriptions of procedures to WDOH for review and approval. These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]
- 39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]
- 40) The differential pressure across each filter bank shall be monitored, recorded, and trended.

Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

- 41) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]
- 42) Alternate power supplied by the generators shall be available for the exhaust fans upon loss of normal facility electrical power. [WAC 246-247-120]
- 43) Differential pressures shall be monitored between C3 and C5 areas to ensure air flow is from the C3 to C5 areas. [WAC 246-247-120]
- 44) Interlocks shall be in place to prevent operation of the LV-S1 emission unit upon loss of power to the C5 ventilation. [WAC 246-247-120]
- 45) Backflow dampers between C3 and C5 ventilation systems must comply with "AMCA Publication 500. Permission to use this standard in this application is based on information submitted to WDOH by the WTP on Dec. 17, 2002. [WAC 246-247-120]
- 46) Emission unit LV-S2 shall be continuously sampled. Radionuclides which contribute 10% of the unabated dose or greater, produce a unabated dose of 0.1mrem/yr, and radionuclides that contribute 25% of the abated dose or greater shall be sampled, analyzed, and reported. This shall include at a minimum Am-241 and Sr-90. Prior to hot commissioning, the procedure to manage down time or failure time of continuous sampling equipment will be developed and submitted to WDOH for review and approval. [WAC 246-247-040 (1); WAC 246-247-075]
- 47) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040 (1); WAC 246-247-075]
- 48) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]
- 49) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]
- 50) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into areas ventilated by emission unit LV-S2. [WAC 246-247-120]
- 51) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

**DEPARTMENT OF HEALTH  
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APPROVAL FOR  
PROJECT TITLE: CONSTRUCTION OF (WTP) LAW VITRIFICATION PLANT**

Emission Unit Name: ILAW-C2

Emission Unit ID 752

This is a MINOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]  
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	One stage of HEPA filtration. A total of three banks of primary HEPAs two in operation and one in standby. Each bank contains four filters.
	Exhaust Fan	2	Two in operation.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Gross Alpha and Gross Beta/Gamma	Shall be determined prior to cold commissioning

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with some typographical changes, AIR 03-1014, mailed on October 23, 2003.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.
- 3) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:  
the receipt of low-activity waste feed from the Pretreatment Facility and conversion of the waste slurry and glass formers into molten glass. See process descriptions listed below for the individual emission units.



- 4) This NOC does not have "Annual Possession Quantity" limits.
- 5) The WDOH has determined that BARCT for emission unit ILAW-C2 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a single stage of High-Efficiency Particulate Air (HEPA) filtration, and Exhaust Fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

Space temperatures from which C2 air is exhausted shall be measured as the inlet airstream temperature for each HEPA filter bank by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication. The C2V exhaust air stream temperature shall at all times be above the dewpoint, therefore Relative Humidity (RH) for this emission unit shall not be a required HEPA operating parameter nor shall an indication device be required. Should design or operations change in such a way that RH becomes a key operating parameter for the HEPA banks of this emission unit, an indication device shall be required prior to implementing the change.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

- 6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to the following:

-Storage of sealed canisters of glass-immobilized low-activity waste.

Detailed descriptions of activities in the areas ventilated by this emission unit will be provided to WDOH prior to cold commissioning. The WDOH reserves the right to determine if changes in this process description constitute a significant modification under WAC 246-247-030 (16) & (25). [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

- 7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]
- 8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall

recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MFL doses for all WTP emission units and submit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110 (10,11,12,13,14,15)]

- 9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110 (5)]
- 10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) & (4)]
- 11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) & (4)]
- 12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040(3)]

- 13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]
- 14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]
- 15) The facility shall notify the department seven days in advance of any planned pre-operational testing of

the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]

- 16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]
- 17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]
- 19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]
- 20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]
- 21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]
- 22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]
- 23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]
- 24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]
- 25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). [WAC 246-247(6) and (8)]

- 26) All facilities must maintain records documenting the source of input parameters including the results of

all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]

- 27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]
- 28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]
- 29) (a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the WDOH Code Compliance Matrix for LAW HVAC System, 24590-WTP-RPT-ENG-02-001, Rev. A, dated November 15, 2002" and the WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003. [WAC 246-247-120]
- (b) Emission unit components design, construction, testing, and operation different from those identified in WDOH Code Compliance Matrix for LAW HVAC System, 24590-WTP-RPT-ENG-02-001, Rev. A, dated November 15, 2002" and the WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated Jun 5, 2003 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]
- (c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]
- (d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]
- 30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the applicable standards the WDOH Code Compliance Matrix for LAW HVAC System, 24590-WTP-RPT-ENG-02-001, Rev. A, dated November 15, 2002" and the WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003 , shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, dampers, ductwork, and indication devices. [WAC 246-247-120]
- 31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the

monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]

- 32) The annual ILAW production from the LAW plant shall not exceed 1.825 E4 metric tons/year, based on glass as the waste form. [WAC 246-247-030(5); WAC 246-47-110 (10)]
- 33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]
- 34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]
- 35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank. The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]
- 36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]
- 37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080 (7)]
- 38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall provide critical operating acceptable operating ranges develop operating procedures to monitor and maintain these parameters provide descriptions of procedures to WDOH for review and approval. These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]
- 39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]
- 40) The differential pressure across each filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

- 41) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to

demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

- 42) External surface smearable contamination concentrations for ILAW welded glass storage containers shall not exceed 2200 dpm/100 cm<sup>2</sup> for beta/gamma emitters or 220 dpm/100 cm<sup>2</sup> for alpha emitters.

Surface concentrations of smearable contamination for all surface areas other than container surfaces within ILAW-C2 ventilation areas shall not exceed 1,000 dpm/100 cm<sup>2</sup> for beta/gamma emitters or 20 dpm/100 cm<sup>2</sup> for alpha emitters. [WAC 246-247-110(10,11,12,13)]

- 43) The USDOE shall perform radiation surveys on at least a quarterly basis of the smearable surface radioactive contamination of exposed surface areas ventilated by emission unit ILAW -C2. The USDOE shall use the data from these surveys to demonstrate that the annual average surface concentration of beta/gamma emitters does not exceed 1000 dpm/100 cm<sup>2</sup> over exposed surfaces other than containers and that the annual average surface concentration of alpha emitters does not exceed 20 dpm/100 cm<sup>2</sup> over exposed surfaces other than containers. [WAC 246-247-110 (10,11,12,13)]
- 44) If electrical power to operate exhaust fans for this emission unit fails, normal operations within this emission unit with the potential to produce particulates shall cease until power is restored. [WAC 246-247-120]
- 45) Interlocks shall be in place to prevent operation of the LV-C2 emission unit upon loss of power to the C3 ventilation. [WAC 246-247-120]
- 46) For emission unit ILAW -C2, periodic confirmatory sampling for particulates shall be performed, with analyses for gross alpha and gross beta/gamma. [WAC 246-247-040(1); WAC 246-247-075]
- 47) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]
- 48) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]
- 49) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]
- 50) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into Areas ventilated by emission unit ILAW-C2. [WAC 246-247-120]

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR  
**PROJECT TITLE: CONSTRUCTION OF (WTP) PRETREATMENT PLANT**

Emission Unit Name: PT-S3

Emission Unit ID 534

This is a MAJOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: BARCT

ALABACT [WAC 246-247-040(4)]

BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	Caustic Scrubber	1	One in operation
	HEME	3	Two in operation and one in stand-by.
	Heater	2	One heater in operation and one in stand-by.
	HEPA	2	Two stages of HEPA filtration. A total of three banks of primary HEPAs one in operation and two in standby. Each bank contains two filters. A total three banks of secondary HEPAs one in operation and two in standby. Each bank contains two filters.
	Exhaust Fan	2	One in operation and one in standby.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4).	Am-241, Co-60, Cm-244, Cs-137, C-14, I-129, Np-237, Sm-151, Sr-90, Tc-99, U-234, Ru-106, and Cs-137	Continuous

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.**Change History**

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with some typographical changes, AIR 03-1015, mailed on October 23, 2003

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

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- 2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.
- 3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**  
the receipt of waste from the Double Shell Tank system for the separation and preparation of the Low-Activity Waste and High-Level Waste feeds for vitrification. See process descriptions listed below for the individual emission units.
- 4) This NOC does not have "Annual Possession Quantity" limits.
- 5) The WDOH has determined that BARCT for emission unit PT-S3 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a Caustic Scrubber, High Efficiency Mist Eliminators (HEMEs), a Heater, two stages of High-Efficiency Particulate Air (HEPA) filtration in series, and Exhaust Fans. Control technologies for operation of the emission unit that are not regulated by this license (located between the HEPA and Exhaust Fans) are a Thermal Oxidizer, an After cooler, a Carbon Bed Adsorber, and a Moderate Efficiency Filter (MOD).

The maximum differential pressure across each filter HEPA bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

The inlet airstream temperatures for each HEPA filter bank shall be measured by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The temperature differential shall be controlled to ensure Relative Humidity (RH) is within acceptable limits. The moisture content of the inlet airstream for each HEPA filter bank shall be measured by a capacitive moisture sensor that is specified to be tolerant of particulate contamination and most chemicals. The dewpoint of offgas air flow shall be measured and subsequently controlled by temperature to ensure that the air stream is above its dewpoint in order to prevent condensation in offgas treatment equipment such as HEPA filters. The various component selections for moisture sensor instruments shall be based on factors that include range, accuracy, offgas stream constituents, and radiation levels.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval.

[WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-040(5); WAC 246-247-120]



- 6) No activities, other than those explicitly described within this approval, shall be conducted. Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040 (3)]

The approved activities are limited to:

The following activities within the C5 areas are ventilated by the PT-S3 emission unit:

-Waste Feed Receipt System (C5): the waste feed receipt system shall be located within C5 areas and shall receive tank waste from the DST system and recycle streams from pretreatment waste processing. The waste feed receipt system shall provide access for waste sampling, shall provide lag storage for the waste, and shall transfer the waste feed to other systems within the pretreatment plant.

-Waste Feed Evaporation System (C5; Condensate Tanks C3): The waste feed evaporation system shall include two evaporator trains arranged in parallel but capable of independent operation. The waste feed evaporators shall incorporate forced-circulation units operating under vacuum to reduce the operating temperature of the waste stream. Each evaporator feed vessel shall incorporate a pulse jet agitation system to provide mixing and to prevent settling of solids. The waste feed from the feed vessels shall be pumped continuously to the evaporator.

The re-circulation pump shall maintain a high flow rate within the evaporation system. The re-circulation pump shall transfer the waste through the reboiler and back into the separator vessel. The re-circulating waste stream shall be prevented from boiling in the reboiler tubes by maintaining sufficient hydrostatic head to increase the boiling point above the temperature of the liquor in the reboiler.

As the liquid travels through the reboiler, the hydrostatic head shall diminish and flash evaporation shall occur as the flow enters the separator vessel. The liquid shall continue to flash to equilibrium, and the vapor and liquid streams shall be separated. The liquid stream shall be circulated in this loop and become more concentrated. The concentrated waste stream shall be pumped out of the evaporator system to the ultra filtration process system.

The waste feed evaporators shall be operated at 50 oC (122 oF). The waste feed evaporators shall concentrate dissolved solids to a concentration in the range of 8 to 10 molar.

-Ultrafiltration System (C5): The ultrafiltration system shall separate the evaporator effluent into a solids waste stream (the HLW feed stream) and the liquid permeate (LAW feed stream). The ultrafiltration system shall receive waste feed in batch modes. Chemicals shall be added to the waste mixture and heated and agitated to complex the transuranic elements and strontium. The heating temperature shall be less than 80 degrees C (176 degrees F), and vaporization of radionuclides shall be prevented.

The waste stream shall be fed to the ultrafilters. The liquids (permeate) shall pass through the permeable ultrafilter surface while the solids are retained. The ultrafiltration permeate, designated as the LAW feed stream, shall be further treated within the pretreatment plant prior to treatment through the LAW vitrification systems. The concentrated solids stream, designated as HLW feed, shall be

stored at the pretreatment plant and blended with other HLW feed streams. This mixture shall ultimately be processed through the HLW vitrification systems.

Periodic cleaning of the ultrafilters shall be accomplished by back-flushing with filter permeate and chemical cleaning agents. Ventilation offgas from the permeate collection vessels shall be controlled by the process vessel ventilation system.

-HLW Lag Storage and Blending System (C5): The HLW lag storage and blending system shall receive the HLW feed stream from the ultrafiltration system, provide lag storage for the high solids slurry, blend the HLW vitrification feed prior to processing in the HLW vitrification plant, and blend cesium and technetium concentrates from the LAW treatment process into the HLW feed stream prior to transfer to the HLW vitrification plant.

-Cesium Ion Exchange System (C5): The cesium ion exchange system shall remove cesium from the LAW feed stream with a series of four ion exchange columns which shall be rotated and finally eluted with dilute nitric acid to remove the cesium. Resin flush solution and spent resin shall be transferred to the spent resin collection vessels as a slurry. Spent resin collection vessels shall be ventilated by the process vessel ventilation system.

Three of the four ion exchange columns shall operate in the loading cycle in series (i.e., a lead, a lag, and a polish column). The fourth column shall operate in parallel with the other columns and shall be eluted and regenerated, or have its spent-ion exchange media replaced. The column feeds shall be rotated so that:

- The lead column is taken offline for elution/regeneration/media replacement
- The lag column becomes the lead column
- The polish column becomes the lag column
- The regenerated column becomes the polish column

The polishing column shall be used in the loading cycle to ensure adequate removal of cesium.

The concentration of cesium in the treated LAW shall be monitored. Loading operation shall be switched to the next position when the cesium concentration in the effluent of the lead column reaches a predetermined breakthrough point, or if significant amounts of cesium are detected in the effluent of the lag column or in the effluent of the polishing column.

When the ion exchange column resin loses performance, the spent resin shall be slurried out of the column to the spent resin collection and dewatering system. A slurry of fresh resin shall then be added to the column as bed replacement.

Resin flush solution and spent resin shall be transferred to the spent resin collection vessels. Excess resin flush solution shall be purged to the waste feed evaporator. Excess transport liquid shall be collected in the spent resin collection and dewatering system for use as resin removal flush solution.

Spent resin collection vessels shall be ventilated by the process vessel ventilation system.

-Cesium Nitric Acid Recovery System (C5): The cesium nitric acid recovery system shall recover used nitric acid from the cesium ion exchange resin bed elution for reuse. Eluate composed of cesium-bearing nitric acid shall be fed to the nitric acid recovery evaporator operating under reduced pressure

to lower the operating temperature. The nitric acid stream shall be recirculated from the evaporator to the steam-heated reboiler. The concentrated eluant in the evaporator shall be routed to a concentrate storage tank for blending into the HLW melter feed stream. The cesium nitric acid recovery system shall be in standby mode when a cesium ion exchange column is not being eluted.

-Technetium Ion Exchange System (C5): The technetium ion exchange system shall remove technetium from the LAW feed stream with a series of four ion exchange columns which shall be rotated and finally eluted with water to remove the technetium. Resin flush solution and spent resin shall be transferred to the spent resin collection and dewatering system as a slurry. Spent resin collection vessels shall be ventilated by the process vessel ventilation system.

Three of the four ion exchange columns shall operate in the loading cycle in series (i.e., a lead, a lag, and a polish column). The fourth column shall operate in parallel with the other columns and shall be eluted and regenerated, or have its spent-ion exchange media replaced. The column feeds shall be rotated so that:

- The lead column is taken offline for elution/regeneration/media replacement

- The lag column becomes the lead column

- The polish column becomes the lag column

- The regenerated column becomes the polish column

The polishing column shall be used in the loading cycle to ensure adequate removal of technetium.

The concentration of technetium in the treated LAW shall be monitored. Loading operation shall be switched to the next position when the technetium concentration in the effluent of the lead column reaches a predetermined breakthrough point, or if significant amounts of technetium are detected in the effluent of the lag column or in the effluent of the polishing column.

When the ion exchange column resin loses performance, the spent resin shall be slurried out of the column to the spent resin collection and dewatering system. A slurry of fresh resin shall then be added to the column as bed replacement.

-Technetium Eluant Recovery System (C5): The technetium eluant recovery system shall recover water from eluate from elution of the technetium ion exchange resin beds. Eluant composed of technetium-bearing water shall be fed to the technetium recovery evaporator operating under reduced pressure to lower the operating temperature. The eluant stream shall be recirculated from the evaporator to the steam-heated reboiler. Vapors from the evaporator shall be recovered and collected in the recovered technetium eluant vessel and shall be reused. Concentrated technetium solution in the evaporator shall be combined with the cesium concentrate and shall be incorporated into the HLW feed stream for vitrification. The technetium eluant recovery system shall be in standby mode when no technetium column is being eluted. The major vessels of the technetium eluant recovery system shall be equipped with internal wash rings for decontamination of the system.

-Spent Resin Collection and Dewatering System (C5): The spent resin collection and dewatering system shall remove fully eluted spent resin from the ion exchange columns in the cesium or technetium ion exchange processes. Resin removal transport liquid shall be pumped from the spent resin collection system to the designated ion exchange column to fluidize the resin particles and carry the resin particles to the spent resin collection system. In the spent resin collection system, the resin shall be sampled and either sent back to an ion exchange column for further elution or sent forward to a

disposable resin dewatering container.

Spent resin shall be transferred through process piping directly into a shielded disposal/transport container located in a C5 area specifically designated for loading and dewatering the resin. After transfer into the container, the resin shall be dewatered, and the container shall be sealed to meet applicable transportation and disposal requirements. After verification of free release contamination levels, the containers shall be transferred via airlocks to the truck loading area. The dewatering area shall be classified as a C5 area during container filling but the area shall be classified as a C3 area during transfer of the vessels. A crane in the truck loading area shall be used to transfer the container from the cart to the transport vehicle.

-Treated LAW Evaporation System (C5; Condensate Tanks C3): The treated LAW evaporation system shall further concentrate the treated LAW feed from the technetium ion exchange system. This system shall also process purge liquid from the submerged bed scrubber (SBS) from LAW vitrification offgas control systems. The treated LAW evaporator shall be a forced-circulation unit operating under vacuum to reduce the process fluid temperature rise and maintain a process temperature of approximately 50 degrees C (122 degrees F). The treated LAW feed from the technetium ion exchange system shall be transferred to the treated LAW evaporation system. The SBS purge liquor from LAW vitrification shall be received and neutralized prior to evaporation.

The two feeds to the treated LAW evaporator shall be pumped continuously to the suction side of the recirculation pump, which shall transfer the waste through the reboiler and back into the separator vessel. The recirculating waste stream shall be prevented from boiling in the reboiler tubes by maintaining sufficient hydrostatic head to increase the boiling point above the temperature of the liquor in the reboiler.

Flash evaporation shall occur as the flow enters the separator vessel. The liquid shall continue to flash to equilibrium, and the vapor and liquid streams shall be separated. The liquid stream shall continue to circulate in the closed system, and the vapor stream shall pass into the evaporator offgas system. The concentrated waste stream shall be pumped continuously out of the evaporator system. The concentrate take-off shall be located on the suction line of the re-circulation pump. The concentrated waste stream shall be stored and processed through the LAW vitrification plant.

-Plant Wash and Disposal System (C5): The plant wash and disposal system shall receive, store, and transfer plant wash, drain effluent, and acidic or alkaline effluent from the pretreatment plant. Plant wash and drain effluents shall be collected and mixed with other effluents in the plant wash vessel prior to transfer. Effluent solutions shall be analyzed for pH and excess acidic effluent shall be neutralized and shall be recycled to the waste feed evaporation system.

High-activity and alkaline effluent shall be received, stored, and neutralized in the primary acidic/alkaline effluent vessel or the secondary acidic/alkaline/ effluent vessel prior to transfer. In both vessels, the acidic and alkaline effluents shall be mixed to neutralize the effluents. The mixture shall be analyzed and neutralized, if necessary. When the effluent meets the predetermined pH value, it shall be transferred to the waste feed evaporation system for recycling.

The alkaline effluent vessels shall primarily receive caustic scrubber purge from LAW vitrification and effluents from the technetium ion exchange system. The effluents are sampled and, if they meet acceptability requirements, they shall be sent to the radioactive liquid disposal system. If the effluent

does not meet requirements, it shall be sent to the treated LAW evaporation system.

The C3 drain collection vessel shall receive floor drains and floor sumps effluent from C3 areas. These effluents shall be transferred to the plant wash vessel for treatment.

The HLW effluent transfer vessel shall receive HLW acidic wastes from HLW vitrification line drains from HLW vitrification/pretreatment plant interface lines and laboratory drains. These effluents shall be transferred to the plant wash vessel to recover effluents back into the process system.

The ultimate overflow vessel shall receive overflows from vessels in the pretreatment plant and also line drains and flushes. The vessel operating level shall be maintained below a predetermined level to hold 30 minutes of overflow at the highest transfer rate within the plant.

-Radioactive Liquid Waste Disposal System (C3): The radioactive waste disposal system shall receive, store, and transfer contaminated liquid effluents. The radioactive liquid waste disposal system shall receive low-activity and/or dangerous waste effluents.

This radioactive liquid waste disposal system shall receive primarily effluent from caustic scrubber purges from the LAW vitrification plant via the plant wash and disposal system, waste feed evaporator system, and the treated LAW evaporator system. Liquid effluents from this system shall be recycled or discharged to the LERF and then transferred to the ETP.

-Radioactive Solid Waste Handling System (C3): The radioactive solid waste handling system shall provide the following functions: lifting, holding, and transporting disposal containers; packaging disposal containers and preparing the containers for shipping; decontamination of waste and cleaning and remote monitoring of disposal containers; and temporary shielding and confinement barriers. This system shall handle failed process equipment: pumps, valves, filters, jumpers, and maintenance equipment. [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

- 7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]
- 8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH.

A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate.

[WAC 246-247-110(10,11,12,13,14,15)]

- 9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under

WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110 (5)]

- 10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) & (4)]
- 11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) & (4)]
- 12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNJ Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC.

[WAC 246-247-040 (3)]

- 13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and shall identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures that shall be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]
- 14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]
- 15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]
- 16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6);

- 17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [(WAC 246-247-075(9) and (10)]
- 18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]
- 19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]
- 20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]
- 21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]
- 22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]
- 23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]
- 24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5), (WAC 246-247-080(5)).
- 25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). [WAC 246-247(6) and (8)]

- 26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]

- 27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]
- 28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]
- 29) a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002. [WAC 246-247-120]  
  
b) Emission unit components design, construction, testing, and operation different from those identified in the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]  
  
c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]  
  
d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]
- 30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, valves, piping, and indication devices. [WAC 246-247-120]
- 31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]
- 32) The total radioactivity feed to the WTP Pretreatment Facility from sources exterior to the WTP (that is, the sum of Waste Streams SVS103 and SVS116) shall not exceed 1.1E+08 curies/year. [WAC 246-247-030(5); WAC 246-47-110 (10)]
- 33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997" Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%.



[WAC 246-247-120]

- 34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

- 35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup.

[WAC 246-247-120]

- 36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

- 37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080 (7)]

- 38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

- provide critical operating parameters;
- develop acceptable operating ranges;
- develop operating procedures to monitor and maintain these parameters;
- provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

- 39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The USDOE shall provide manufacturer's specifications, including published removal efficiencies and installation requirements, to demonstrate to WDOH that the High Efficiency Mist Eliminator and Caustic Scrubber in this emission control unit are intended to operate at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. This information shall be provided to the WDOH at least 90 days prior to hot commissioning.

Where actual measurements are impossible, the USDOE shall provide to the WDOH for approval prior to hot startup sufficient information to demonstrate that the control equipment has been installed in

accordance with manufacturers' specifications and that the manufacturers' specifications shall achieve design removal efficiencies. [WAC 246-247-120]

- 40) The differential pressure across each filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH.

[WAC 246-247-120]

- 41) If temperatures of air entering the HEPA filters exceed the manufacturer's recommendations for the filters, WDOH shall be notified and the cause of the temperature excursion shall be determined. HEPA filters shall be evaluated for the need to be replaced. [WAC 246-247-120]
- 42) Prior to cold commissioning, the USDOE shall provide documentation entering the WDOH for approval to demonstrate that humidity in the airstream to the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]
- 43) The USDOE shall notify the WDOH before initiating use of any maintenance ventilation bypass line for the Pretreatment facility Caustic Scrubber. Prior to initiating use of any maintenance ventilation bypass line for the Pretreatment Caustic Scrubber, waste feed to the Pretreatment facility shall be halted. While the Pretreatment Caustic Scrubber maintenance bypass line is in use, offgas shall be treated with all other emission control system components for emission unit PT-S3, including the HEME and HEPA filtration. Prior to hot commissioning, appropriate descriptions of procedures to initiate this by-pass system shall be established, and shall be provided to WDOH for review and approval. [WAC 246-247-120]
- 44) Waste processing through the pretreatment facility shall cease during the loss of site electric power. The exhaust from the operation of purge air to control the hydrogen concentration in the process vessel head space shall be rerouted and treated through the emission control equipment for emission unit PT-S2: two stages of High-Efficiency Particulate Air (HEPA) filtration in series, and Exhaust Fans.

Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the inlet airstream to the operating HEPA filter bank during bypass operation due to power loss shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

- 45) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002.

Emission unit PT-S3 shall be continuously monitored with analyses for gross alpha and gross beta/gamma.

Radionuclides which contribute 10% of the unabated dose or greater, produce a unabated dose of 0.1mrem/yr, and radionuclides that contribute 25% of the abated dose or greater shall be continuously sampled, analyzed, and reported. This shall include at a minimum Am-241, Co-60, Cm-244, Cs-137, C-14, I-129, Np-237, Sm-151, Sr-90, Tc-99, U-234, Ru-106, and Cs-134.

Prior to hot commissioning, a procedure to manage down time or failure time of continuous sampling

and monitoring equipment will be developed, and a description of this procedure shall be submitted to WDOH for review and approval. [WAC 246-247-040 (1); WAC 246-247-075]

- 46) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040 (1); WAC 246-247-075]
- 47) A new air sampling station shall be established at a distance of approximately 1500 meters in the ESE direction from WTP. This sampling station is hereinafter called the "New Station".
- 48) The following ambient air sampling stations shall be operated as a monitoring network, with all sampling, analysis, interpretation, and reporting to be managed as a single entity: a) the New Station, b) Vit Plant North, c) B Pond, d) 200 ESE, e) N-977, f) N-985, g) N-158, h) N-984, i) N-498, j) N-499, k) West End Fir Road.
- 49) At all 11 of these stations the following air sampling regime shall be conducted: a) gross alpha/gross beta samples shall be collected on a bi-weekly basis (particulate air filters operated for two-week periods); b) particulate air samples shall be composited on a monthly basis and analyzed by gamma scan for the following radionuclides: Ru-106, Sb-125, Cs-134, Cs-137, Eu-154, and Am-241, plus any other radionuclides with positive activities greater than the MDA; and c) particulate air samples shall be composited on a quarterly basis and analyzed with appropriate radiochemical methods for Sr-90 and Pu-239/240.
- 50) At the New Station, the Station at 200 ESE, and the Station at the West End of Fir Road, the following additional air samples shall be collected: a) tritium samples shall be obtained with silica gel or molecular sieve filters, collected approximately monthly, and the extracted moisture shall be analyzed by liquid scintillation; b) continuous air samples shall be collected on a monthly basis with appropriate sample media and analyzed with appropriate radiochemical techniques for  $^{14}\text{C}$ ; and c) continuous air samples shall be collected with appropriate media and combined on a quarterly basis to be analyzed with appropriate radiochemical techniques for I-129.
- 51) Sampling and sample analysis regimes used for WTP ambient air monitoring shall meet or exceed the following minimum detectable concentrations over the above specified sampling periods:

ANALYSIS	Minimum Detectable Concentration
Gross Alpha:	0.001 pCi/m <sup>3</sup>
Gross Beta:	0.003 pCi/m <sup>3</sup>
Tritium:	3 pCi/m <sup>3</sup>
Strontium-90 :	0.0001 pCi/m <sup>3</sup>
Iodine 129:	0.00001 pCi/m <sup>3</sup>
Gamma Scan (Cs-137):	0.01 pCi/m <sup>3</sup>
Pu Isotopic :	0.000005 pCi/m <sup>3</sup>
Americium-241:	0.00005 pCi/m <sup>3</sup>

- 52) Preoperational monitoring shall be performed to obtain a baseline of all analytes prior to commencement of processing of radioactive waste at the WTP. A baseline dataset of 12 contiguous months of validated data shall be provided to WDOH for review and approval.
- 53) The operational status of the data management system for collecting, validating, and evaluating WTP ambient monitoring data shall be demonstrated to WDOH by providing in report form the baseline dataset of 12 contiguous months of validated data of all analytes for review and approval.
- 54) Validated gross beta sample results from all 10 stations shall be reported within 30 days of sample

collection, and all data shall be promptly analyzed for trends.

- 55) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]
- 56) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]
- 57) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into areas ventilated by emission unit PT-S3. [WAC 246-247-120]
- 58) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR  
PROJECT TITLE: CONSTRUCTION OF (WTP) PRETREATMENT PLANT

Emission Unit Name: PT-S4

Emission Unit ID 543

This is a MAJOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]

BARCT [WAC 246-247-010(3)]

<u>Zone or Area:</u>	<u>Abatement Technology</u>	<u>Required # of Units</u>	<u>Additional Description/Conditions</u>
	Demister	3	Two in operation and one in standby.
	Injection Air	1	Operational.
	Moderate Efficiency Filter	1	One in operation and one in stand-by. Conditions air from C3 air inbleed prior to combining with Pulse Vent Exhaust stream of PT-S4 and prior to primary HEPA filtration.
	Heater	1	One in operation and one in stand-by. Conditions air from C3 air inbleed prior to combining with Pulse Vent Exhaust stream of PT-S4 and prior to primary HEPA filtration.
	HEPA	1	One in operation and one in stand-by. Conditions air from C3 air inbleed prior to combining with Pulse Vent Exhaust stream of PT-S4 and prior to primary HEPA filtration.
	HEPA	2	Two stages of HEPA filtration. A total of seven banks of primary HEPAs five in operation and two in standby. Each bank contains five filters. A total six banks of secondary HEPAs four in operation and two in standby. Each bank contains six filters.
	Exhaust Fan	3	Two in operation and one in standby.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

<u>Federal and State Regulatory</u>	<u>Monitoring and Testing Procedure</u>	<u>Radionuclides Requiring Measurement</u>	<u>Sampling Frequency</u>
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Am-241, C-14, Co-60, Cs-137, Eu-154, Pu-238, Pu-239, Pu-240, Pu-241, Sb-125, Sr-90, U-234, Ru-106, Cs-134.	Continuous

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

## **Change History**

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with some typographical changes, AIR 03-1015, mailed on October 23, 2003.

## **CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.
- 3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**  
the receipt of waste from the Double Shell Tank system for the separation and preparation of the Low-Activity Waste and High-Level Waste feeds for vitrification. See process descriptions listed below for the individual emission units.
- 4) This NOC does not have "Annual Possession Quantity" limits.
- 5) The WDOH has determined that BARCT for emission unit PT-S4 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: demisters, an injection of conditioned C3 air delivered through a module comprised of a Moderate Efficiency Filter (MOD)/Heater/HEPA, two stages of High-Efficiency Particulate Air (HEPA) filtration in series, and Exhaust Fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

The inlet airstream temperature for each HEPA filter bank shall be measured by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The temperature differential shall be controlled to ensure Relative Humidity (RH) is within acceptable limits. The moisture content of the inlet airstream for each HEPA filter bank shall be measured by a capacitive moisture sensor that is specified to be tolerant of particulate contamination and most chemicals. The dewpoint of offgas air flow shall be measured and subsequently controlled by temperature to ensure that the air stream is above its dewpoint in order to prevent condensation in offgas treatment equipment such as HEPA filters. The various component selections for moisture sensor instruments shall be based on factors that include range, accuracy, offgas stream constituents, and radiation levels.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-040(5); WAC 246-247-120]

- 6) No activities, other than those explicitly described within this approval, shall be conducted. Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040 (3)]

The approved activities are limited to:

Exhaust from the Reverse-Flow Diverters/Pulse Jet Mixers (RFD/PJMs) shall be vented through emission unit PT-S4. The RFD/PJMs shall be used within the pretreatment plant for metered transfer of liquids or slurries throughout the pretreatment process. The following is a description of the operation of an RFD:

Operation of the RFD is cyclical, following timed phases: suction phase, drive phase, and blowdown.

**Suction Phase.** In the suction phase, the secondary automatic valve is opened, admitting air to the suction jet pump. A second valve is then shut, and liquid is drawn from the supply tank through the RFD and into the charge vessel. The suction ejector is designed so that it cannot produce a vacuum capable of lifting liquid higher than the suction lift valve. The liquid reaches this "suction lift" height and stops, and then the first valve is shut.

**Drive Phase.** When the first valve is shut, the second valve is opened, admitting air to the drive nozzle. Air passes through the nozzle and pressurizes the charge vessel. Liquid is forced across the RFD and into the delivery pipe. The delivery pipe is then filled with liquid that flows into the delivery vessel.

**Blowdown phase.** When the charge vessel is nearly empty, the second valve is shut; no air is supplied to either jet pump. The compressed air in the charge vessel passes back through the paired jet pumps, down the vent pipe, and into the vessel vent system.

Shortly after blowdown begins, the pressure in the charge vessel falls below the delivery head, and the flow of liquid into the delivery vessel is halted. The liquid in the delivery vessel then falls back down the pipe, across the reverse flow diverter, and into the charge vessel. After a short time, the pressure in the charge vessel falls to zero (gauge). The cycle is now complete.

The exhausts for the PJV system originate from the operation of the RFDs and the PJM pulse tubes located below the liquid level in the process vessels. These fluidic devices use motive compressed air to lower and raise the level of liquid in the charge vessels located within the process vessel for the purpose of mixing via PJMs and fluid transfer via RFDs. Even though the total air flow from all the RFDs and PJMs is significant, only a small fraction of this air passes through the charge vessels, the remainder being the motive air for the suction jets used to draw suction on the charge vessels.

Compressed air supply to the jet pumps used for the fluidic mixing devices for the process vessels pushes the liquid out to the lower operating level in the charge vessel during the mixing drive cycle or the RFD drive phase. The gases from the charge vessel are exhausted during the suction cycle by another jet pump to the RFD/PJM exhaust header so that the operating level shall rise to the upper limit in the charge vessel. The combination of the suction and discharge cycles provides the required mixing in the process vessel.

Controls shall be provided for the compressed air supply to the RFD/PJMs to avoid a flow surge into the vapor space inside the process vessel, referred to as "overflow". The air lines in the air supply racks that vent the PJMs and RFD charge vessels have pressure sensors to control the air flow. These pressure sensors detect the significant difference in backpressure that occurs at the point when air instead of liquid flows through the PJM nozzle or RFD line. The pressure sensors then send a signal to close the drive air supply valves and alert the operator of the overflow situation. Once detected, the cycle shall be adjusted to avoid overflow on subsequent cycles.

The time that air blows into the vessel is a period of a few seconds. The quantity of air that discharges to the vessel during an overflow is small compared to the capacity of the vessel vent system and shall contribute no significant potential to emit. [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

- 7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]
- 8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH.

A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110(10,11,12,13,14,15)]

- 9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110 (5)]
- 10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) & (4)]
- 11) Any additional licensing necessitated by plant design changes may require additional or different



controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040 (3) & (4)]

- 12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040 (3)]

- 13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and shall identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures that shall be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]
- 14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]
- 15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]
- 16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]
- 17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [(WAC 246-247-075(9) and (10)]
- 18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]
- 19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]

- 20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]
- 21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]
- 22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]
- 23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]
- 24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5), (WAC 246-247-080(5)).
- 25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.
- Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). [WAC 246-247(6) and (8)]
- 26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]
- 27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]
- 28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The

USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]

- 29) a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002. [WAC 246-247-120]
- b) Emission unit components design, construction, testing, and operation different from those identified in the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]
- c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]
- d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]
- 30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, valves, piping, and indication devices. [WAC 246-247-120]
- 31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]
- 32) The total radioactivity feed to the WTP Pretreatment Facility from sources exterior to the WTP (that is, the sum of Waste Streams SVS103 and SVS116) shall not exceed  $1.1E+08$  curies/year. [WAC 246-247-030(5); WAC 246-47-110 (10)]
- 33) HEPA filters shall be tested in-place after installation and at least annually there-after. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]
- 34) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]
- 35) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080 (7)]

- 36) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

- provide critical operating parameters;
- develop acceptable operating ranges;
- develop operating procedures to monitor and maintain these parameters;
- provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

- 37) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The USDOE shall provide manufacturer's specifications, including published removal efficiencies and installation requirements, to demonstrate to WDOH that the demister in this emission control unit is intended to operate at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. This information shall be provided to the WDOH at least 90 days prior to hot commissioning.

Where actual measurements are impossible, the USDOE shall provide to the WDOH for approval prior to hot startup sufficient information to demonstrate that the control equipment has been installed in accordance with manufacturers' specifications and that the manufacturers' specifications shall achieve design removal efficiencies. [WAC 246-247-120]

- 38) The differential pressure across each filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

- 39) The USDOE shall prepare documentation which a) identifies the critical operating parameters for pulse jet mixers (PJMs) and reverse flow diverters (RFDs) used in pretreatment processes, and b) prescribes a program to determine the acceptable operating ranges for these parameters during cold commissioning. Prior to cold commissioning the USDOE shall provide documentation describing the procedure(s) and an adequate list of indicator parameters as well as appropriate indicator device(s) for each parameter to the WDOH for review and approval. The USDOE shall determine acceptable operating ranges for these parameters and shall develop operating procedures to maintain the PJMs and RFDs within these ranges. The USDOE shall present these ranges and documentation describing the maintenance and operating procedures for approval prior to accepting radioactive material into the WTP. [WAC 246-247-120]
- 40) If temperatures of air entering the HEPA filters exceed the manufacturer's recommendations for the filters, WDOH shall be notified and the cause of the temperature excursion shall be determined. HEPA filters shall be evaluated for the need to be replaced. [WAC 246-247-120]
- 41) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to

demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

- 42) During the loss of site electric power, waste processing through the pretreatment facility shall cease with the exception of ITS (Important to Safety) mixing operation for selected process vessels. The vent path in the PJV system shall remain open so that the PJM exhausts from these selected process vessels will be treated through the following emission controls for emission unit PT-S4: demisters, , two stages of High-Efficiency Particulate Air (HEPA) filtration in series, without Exhaust Fans. During loss of power, the operation of the Pulse Jet Mixers (PJM) within the ITS vessel shall provide the pressure for exhaust flow into the control systems without motive power by the exhaust fans.

Prior to cold commissioning, the USDOE shall demonstrate in writing to the WDOH for approval that the operation of the Pulse Jet Mixers (PJM) within the ITS vessel is adequate to provide the pressure for exhaust flow into the control systems without motive power by the exhaust fans. [WAC 246-247-120]

- 43) Interlock and preventive devices shall be in place to prevent backflow from PT-S4 to PT-S1 through the C3 air in-bleed system upon loss of power.
- 44) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. Emission unit PT-S4 shall be continuously monitored with analyses for gross alpha and gross beta/gamma. Radionuclides which contribute 10% of the unabated dose or greater, produce a unabated dose of 0.1mrem/yr, and radionuclides that contribute 25% of the abated dose or greater shall be continuously sampled, analyzed, and reported. This shall include at a minimum Am-241, C-14, Co-60, Cs-137, Eu-154, Pu-238, Pu-239, Pu-240, Pu-241, Sb-125, Sr-90, U-234, Ru-106, and Cs-134.

Prior to hot commissioning, a procedure to manage down time or failure time of continuous sampling and monitoring equipment will be developed, and a description of this procedure shall be submitted to WDOH for review and approval. [WAC 246-247-040(1); WAC 246-247-075]

- 45) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]
- 46) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]
- 47) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]
- 48) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into areas ventilated by emission unit PT-S4. [WAC 246-247-120]
- 49) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]
- 50) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS

TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

- 51) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

- 52) The Moderate Efficiency Filter (MOD), heater, and HEPA used to condition air from C3 air inbleed prior to combining with Pulse Vent Exhaust system of PT-S4 shall be demonstrated on a periodic basis to be installed and operating in accordance with facility design specifications.

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

**PROJECT TITLE: CONSTRUCTION OF (WTP) PRETREATMENT PLANT**

Emission Unit Name: PT-C2

Emission Unit ID 544

This is a MINOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]  
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	One stage of HEPA filtration. A total of ten banks of primary HEPA's eight in operation and two in standby. Each bank contains six filters.
	Exhaust Fan	2	Two in operation.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Gross Alpha and Gross Beta/Gamma	Shall be determined prior to cold commissioning

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with some typographical changes, AIR 03-1015, mailed on October 23, 2003.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.
- 3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**  
the receipt of waste from the Double Shell Tank system for the separation and preparation of the Low-Activity Waste and High-Level Waste feeds for vitrification. See process descriptions listed below for the individual emission units.

- 4) This NOC does not have "Annual Possession Quantity" limits.
- 5) The WDOH has determined that BARCT for emission unit PT-C2 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a single stage of High-Efficiency Particulate Air (HEPA) filtration, and Exhaust Fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

Space temperatures from which C2 air is exhausted shall be measured as the inlet airstream temperature for each HEPA filter bank by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The C2V exhaust air stream temperature shall at all times be above the dewpoint, therefore Relative Humidity (RH) for this emission unit shall not be a required HEPA operating parameter nor shall an indication device be required. Should design or operations change in such a way that RH becomes a key operating parameter for the HEPA banks of this emission unit, an indication device shall be required prior to implementing the change.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-040(5); WAC 246-247-120]

- 6) No activities, other than those explicitly described within this approval, shall be conducted. Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040 (3)]

The approved activities are limited to:

The exhaust from the C2 ventilation system shall be vented through emission unit PT-C2. A portion of the air supplied to the C2 areas shall be cascaded into adjacent C3 areas, and the rest shall be exhausted directly by the C2 exhaust system. The C2 exhaust system fans shall be interlocked with the C5 exhaust fans and shall shut down in the event of a failure of the C5 exhaust system to prevent reversal.



The C2 ventilation system shall serve the non-process operating areas, such as hallways, instrument control and instrumentation room, and electrical and mechanical equipment rooms. Access from C2 areas into a C3 shall be via a C2/C3 sub-change room.

Activities ventilated by emission unit PT-C2 with potential to emit radioactive emissions shall be limited to transport of bagged failed manipulator for repair within the C3 workshop; transport of containerized failed equipment for repair within the C3 workshop; transport of containerized failed equipment for storage at the balance-of-facilities area( BOF); transport of containerized miscellaneous wastes for storage at the BOF; transport of personal protection equipment; transport of process samples via auto sampler; filter changeout, aerosol testing, and transport of spent filters; and exhaust fan maintenance. [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

- 7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]
- 8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH.

A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110 (10,11,12,13,14,15)]

- 9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110 (5)]
- 10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) & (4)]
- 11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) & (4)]
- 12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring,

different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040 (3)]

- 13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and shall identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures that shall be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]
- 14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]
- 15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]
- 16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]
- 17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [(WAC 246-247-075(9) and (10))]
- 18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]
- 19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]
- 20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]
- 21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]
- 22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]

- 23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]
- 24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5), (WAC 246-247-080(5)).
- 25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). [WAC 246-247(6) and (8)]

- 26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]
- 27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]
- 28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]
- 29) a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the WDOH Code Compliance Matrix for PTF HVAC System, 24590-WTP-RPT-ENG-02-002, Rev. A, dated November 15, 2002 and WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003. [WAC 246-247-120]

- b) Emission unit components design, construction, testing, and operation different from those identified in the WDOH Code Compliance Matrix for PTF HVAC System, 24590-WTP-RPT-ENG-02-002, Rev. A, dated November 15, 2002 and WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]
- c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]
- d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]
- 30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the WDOH Code Compliance Matrix for PTF HVAC System, 24590-WTP-RPT-ENG-02-002, Rev. A, dated November 15, 2002 and WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, dampers, ductwork, and indication devices. [WAC 246-247-120]
- 31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]
- 32) The total radioactivity feed to the WTP Pretreatment Facility from sources exterior to the WTP (that is, the sum of Waste Streams SVS103 and SVS116) shall not exceed 1.1E+08 curies/year. [WAC 246-247-030(5); WAC 246-47-110 (10)]
- 33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]
- 34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]
- 35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.
- The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]
- 36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination

of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080 (7)]

38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

- provide critical operating parameters;
- develop acceptable operating ranges;
- develop operating procedures to monitor and maintain these parameters;
- provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

40) The differential pressure across each filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation. Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

41) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

42) Surface concentrations of smearable contamination for surface areas within C2 ventilation areas shall not exceed 1,000 dpm/100 cm<sup>2</sup> for beta/gamma emitters or 20 dpm/100 cm<sup>2</sup> for alpha emitters. [WAC 246-247-110 (10,11,12,13)]

43) The USDOE shall perform radiation surveys on at least a quarterly basis of the smearable surface radioactive contamination of exposed surface areas ventilated by emission unit PT-C2. The USDOE shall use the data from these surveys to demonstrate that the annual average surface concentration of beta/gamma emitters does not exceed 1000 dpm/100 cm<sup>2</sup> over a surface area of 4960 m<sup>2</sup>, and that the annual average surface concentration of alpha emitters does not exceed 20 dpm/100 cm<sup>2</sup> over a surface area of 4960 m<sup>2</sup>. [WAC 246-247-110(10,11,12,13)]

44) If electrical power to operate exhaust fans for this emission unit fails, normal operations within this emission unit with the potential to produce particulates shall cease until power is restored. [WAC 246-247-120]

45) Differential pressures shall be monitored between C2 and C3 areas to ensure air flow is from the C2 to C3 areas. [WAC 246-247-120]

46) Interlocks shall be in place to prevent operation of the PT-C2 emission unit upon loss of power to the

C3 ventilation. [WAC 246-247-120]

- 47) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. For emission unit PT-C2, periodic confirmatory emissions sampling for particulates shall be performed, with analyses for gross alpha and gross beta/gamma. [WAC 246-247-040 (1); WAC 246-247-075]
- 48) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040 (1); WAC 246-247-075]
- 49) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]
- 50) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]
- 51) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into areas ventilated by emission unit PT-C2. [WAC 246-247-120]
- 52) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR  
**PROJECT TITLE: CONSTRUCTION OF (WTP) PRETREATMENT PLANT**

Emission Unit Name: PT-S1

Emission Unit ID 545

This is a MINOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]  
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	One stage of HEPA filtration. A total of eight banks of primary HEPAs six in operation and two in standby. Each bank contains six filters.
	Exhaust Fan	3	Two in operation and one in standby.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Gross Alpha and Gross Beta/Gamma	Shall be determined prior to cold commissioning

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with some typographical changes, AIR 03-1015, mailed on October 23, 2003.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.
- 3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**  
the receipt of waste from the Double Shell Tank system for the separation and preparation of the Low-Activity Waste and High-Level Waste feeds for vitrification. See process descriptions listed below for the individual emission units.

- 4) This NOC does not have "Annual Possession Quantity" limits.
- 5) The WDOH has determined that BARCT for emission unit PT-S1 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a single stage of High-Efficiency Particulate Air (HEPA) filtration, and Exhaust Fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

Space temperatures from which C3 air is exhausted shall be measured as the inlet airstream temperature for each HEPA filter bank by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The C3V exhaust air stream temperature shall at all times be above the dewpoint, therefore Relative Humidity (RH) for this emission unit shall not be a required HEPA operating parameter nor shall an indication device be required. Should design or operations change in such a way that RH becomes a key operating parameter for the HEPA banks of this emission unit, an indication device shall be required prior to implementing the change.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-040(5); WAC 246-247-120]

- 6) No activities, other than those explicitly described within this approval, shall be conducted. Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040 (3)]

The approved activities are limited to:

The exhaust from the C3 ventilation system shall be vented through emission unit PT-S1. The C3 ventilation system shall ventilate the filter plant rooms, exhaust fan rooms, bulge rooms, workshops, maintenance areas and monitoring areas. Emissions from these areas shall be vented through emission unit PT-S1 or cascaded into C5 areas and subsequently vented through emission unit PT-S2.



Access into a C3 area shall be via a C2/C3 sub-change room. For C3 areas (the filter plant rooms, exhaust fan rooms, bulge rooms, workshops, maintenance areas and monitoring areas) air shall be cascaded from C2 areas, through transfer grilles in the C2/C3 sub-change room, and into the C3 areas. When a sufficient amount of air cannot be cascaded into a C3 area, a dedicated C2 supply shall be provided with a damper on the C2 supply duct, which shall close in the event of a loss of C3 extract.

C3 designated areas such as the bulge rooms and maintenance areas with greater potential for contamination shall be cascaded directly into neighboring C5 areas via filtered inbleeds. The C3 exhaust system fans are interlocked with the C5 exhaust fans and shall shut down in the event of a failure of the C5 exhaust system.

Activities with potential to emit radioactive emissions shall be limited to pump maintenance, valve maintenance, condenser maintenance, sampler maintenance (shall be decontaminated prior to transfer to C3 workshop), demister/evaporator pad change-out, aerosol testing, exhaust fan maintenance, and filter change-out. [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

- 7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]
- 8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH.

A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110(10,11,12,13,14,15)]

- 9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110 (5)]
- 10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) & (4)]
- 11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) & (4)]
- 12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design

plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040 (3)]

- 13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and shall identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures that shall be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]
- 14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]
- 15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]
- 16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]
- 17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [WAC 246-247-075(9) and (10)]
- 18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]
- 19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]
- 20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]
- 21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]

- 22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]
- 23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]
- 24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5), (WAC 246-247-080(5)).
- 25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). [WAC 246-247(6) and (8)]
- 26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]
- 27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]
- 28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]
- 29) a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the WDOH Code Compliance Matrix for PTF HVAC Systems, 24590-PTF RPT-ENG-02-002, Rev A, dated November 15, 2002 and the WTP Cost Benefit

analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003.  
[WAC 246-247-120]

b) Emission unit components design, construction, testing, and operation different from those identified in the WDOH Code Compliance Matrix for PTF HVAC Systems, 24590-PTF-RPT-ENG-02-002, Rev A, dated November 15, 2002 and the WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003, are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]

c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]

d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]

- 30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the WDOH Code Compliance Matrix for PTF HVAC System, 24590-WTP-RPT-ENG-02-002, Rev. A, dated November 15, 2002 and WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, dampers, ductwork, and indication devices. [WAC 246-247-120]
- 31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]
- 32) The total radioactivity feed to the WTP Pretreatment Facility from sources exterior to the WTP (that is, the sum of Waste Streams SVS103 and SVS116) shall not exceed  $1.1\text{E}+08$  curies/year. [WAC 246-247-030(5); WAC 246-47-110 (10)]
- 33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]
- 34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997". Section FC-5100. [WAC 246-247-120]
- 35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

- 36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]
- 37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080(7)]
- 38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:
- provide critical operating parameters;
  - develop acceptable operating ranges;
  - develop operating procedures to monitor and maintain these parameters;
  - provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

- 39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]
- 40) The differential pressure across each filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

- 41) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]
- 42) Surface concentrations of smearable contamination for surface areas within C3 ventilation areas shall not exceed 100,000 dpm/100 cm<sup>2</sup> for beta/gamma emitters or 1000 dpm/100 cm<sup>2</sup> for alpha emitters. [WAC 246-247-110(10,11,12,13)]
- 43) The USDOE shall perform radiation surveys on at least a quarterly basis of the smearable surface radioactive contamination of exposed surface areas ventilated by emission unit PT-S1. The USDOE shall use the data from these surveys to demonstrate that the annual average surface concentration of beta/gamma emitters does not exceed 100,000 dpm/100 cm<sup>2</sup> over a surface area of 700 m<sup>2</sup>, and that the annual average surface concentration of alpha emitters does not exceed 1000 dpm/100 cm<sup>2</sup> over a surface area of 700 m<sup>2</sup>. [WAC 246-247-110(10,11,12,13)]
- 44) If electrical power to operate exhaust fans for this emission unit fails, normal operations within this emission unit with the potential to produce particulates shall cease until power is restored. [WAC 246-247-120]

- 45) Differential pressures shall be monitored between C2 and C3 areas to ensure air flow is from the C2 to C3 areas.

Differential pressures shall be monitored between C3 and C5 areas to ensure air flow is from the C3 to C5 areas. [WAC 246-247-120]

- 46) Interlocks shall be in place to prevent operation of the PT-S1 emission unit upon loss of power to the C5 ventilation.

Interlocks shall be in place to prevent operation of the PT-C2 emission unit upon loss of power to the C3 ventilation. [WAC 246-247-120]

- 47) Seal leakage for all two-position Dampers serving between C3 and C5 systems shall be leakage Class 1 per ASME AG-1-1997 with ASME AG-1a 2000 Addenda; Article DA-4131 and mandatory Appendix DA-I. [WAC 246-247-120]

- 48) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. For emission unit PT-S1, periodic confirmatory emissions sampling for particulates shall be performed, with analyses for gross alpha and gross beta/gamma. [WAC 246-247-040 (1); WAC 246-247-075]

- 49) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]

- 50) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

- 51) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]

- 52) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into areas ventilated by emission unit PT-S1. [WAC 246-247-120]

- 53) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

DEPARTMENT OF HEALTH  
 RADIOACTIVE AIR EMISSIONS  
 NOTICE OF CONSTRUCTION  
 APPROVAL FOR  
 PROJECT TITLE: CONSTRUCTION OF (WTP) PRETREATMENT PLANT

Emission Unit Name: PT-S2

Emission Unit ID 546

This is a MAJOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: BARCT

ALARA CT [WAC 246-247-040(4)]  
 BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	2	Two stages of HEPA filtration. A total of ten banks of primary HEPAs eight in operation and two in standby. Each bank contains five filters. A total eight banks of secondary HEPAs six in operation and two in standby. Each bank contains six filters.
	Exhaust Fan	3	Two in operation and one in standby.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Radionuclides which contribute 10% to the unabated dose or greater, produce an unabated dose of 0.1 mrem/yr, and radionuclides that contribute 25% of the abated dose or greater. This shall include Cs-137, Am-241, and Sr-90.	Continuous

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with some typographical changes, AIR 03-1015, mailed on October 23, 2003.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license

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'' (WAC 246-247-060(5)).

- 2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.
- 3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**  
the receipt of waste from the Double Shell Tank system for the separation and preparation of the Low-Activity Waste and High-Level Waste feeds for vitrification. See process descriptions listed below for the individual emission units.
- 4) This NOC does not have "Annual Possession Quantity" limits.
- 5) The WDOH has determined that BARCT for emission unit PT-S2 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: two stages of High-Efficiency Particulate Air (HEPA) filtration in series, and Exhaust Fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

Space temperatures from which CS air is exhausted shall be measured as the inlet airstream temperature for each HEPA filter bank by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The CSV exhaust air stream temperature shall at all times be above the dewpoint, therefore Relative Humidity (RH) for this emission unit shall not be a required HEPA operating parameter nor shall an indication device be required. Should design or operations change in such a way that RH becomes a key operating parameter for the HEPA banks of this emission unit, an indication device shall be required prior to implementing the change.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-040(5); WAC 246-247-120]

- 6) No activities, other than those explicitly described within this approval, shall be conducted. Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040(3)]



The approved activities are limited to:

**-Pretreatment Plant Hot Cell:** The pretreatment hot cell shall be located in the central portion of the pretreatment plant.

Process equipment shall be remotely handled in case of failure and shall be removed by an overhead crane or powered manipulator. The hot cell shall also contain a repair area for cranes and powered manipulators. Failed equipment shall be placed in containers and transported through a series of airlock and shield doors to a truck loading area on the outside of the building.

The hot cell shall contain the process equipment: pumps, valves, jumpers, and filters. Activities performed in the hot cell shall include removal and staging of failed, remote-handled process equipment prior to decontamination, and repair and/or packaging waste for disposal.

**-Pretreatment Plant Filter Cave Operations:** The filter cave shall contain all HEPA filters associated with the C5 ventilation and high efficiency mist eliminators (HEME) filters. The cave shall be located in the southeast corner of the pretreatment building at the 56-foot level.

An overhead crane or power manipulator shall be used to change out the HEPA and HEME filters, transport in-cave equipment, and handle tooling for maintenance or operational tasks.

The Pretreatment Plant Filter Cave shall incorporate a dedicated hands-on equipment maintenance area at the east end of the filter cave. This area shall be separated from the filter cave by equipment access shield doors. The area shall contain access platforms, decontamination equipment, fixtures and tooling to perform maintenance activities, and shall serve as an access route for importing clean filters into the cave. The overhead crane or power manipulator shall be parked in the maintenance area when not being used in the filter cave.

Spent filters and HEME elements shall be size-reduced into a disposal container prior to being exported from the cave. The disposal container shall be lowered through an access hatch in the floor of the cave and into a 55-gallon drum. The drum shall be lidded, swabbed, and assayed prior to being exported from the building.

**-Pretreatment In-Cell Maintenance and Decontamination:** Remote-controlled maintenance activities shall be performed in the in-cell maintenance and decontamination area. The activities performed within this area shall be limited to equipment decontamination, equipment disassembly and size reduction. Failed equipment may be placed into a container for disposal or transported to the C3 workshop for repair.

**-Pretreatment Plant C3 Workshop:** Hands-on equipment maintenance performed in the pretreatment plant C3 workshop shall be limited to decontamination, size reduction, and packaging of spent equipment. The area shall be limited to an interim storage area, lag storage area, manipulator decontamination and repair, waste packaging, tool cribs and sub-change rooms. The area shall include hatches to import or export spent equipment. Equipment may be moved by an overhead crane; a crane may also be used for removal or placement of the spent equipment in waste containers. The maintenance activities are limited to pump maintenance, valve maintenance, sampler handling and maintenance, and exhaust fan maintenance. [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]

8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH.

A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110(10,11,12,13,14,15)]

9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110 (5)]

10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) & (4)]

11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) & (4)]

12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040 (3)]

13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and shall identify the specific procedures which will satisfy the Conditions and

Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures that shall be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

- 14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(f)]
- 15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]
- 16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]
- 17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [(WAC 246-247-075(9) and (10))]
- 18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]
- 19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]
- 20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]
- 21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]
- 22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]
- 23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]
- 24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5), (WAC 246-247-080(5)).
- 25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or

completed until a report of closure is received and approved by the Department of Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8). [WAC 246-247(6) and (8)]

- 26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]
- 27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]
- 28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]
- 29) a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the WDOH Code Compliance Matrix for PTF HVAC System, 24590-WTP-RPT-ENG-02-002, Rev. A, dated November 15, 2002. [WAC 246-247-120]  
  
b) Emission unit components design, construction, testing, and operation different from those identified in the WDOH Code Compliance Matrix for PTF HVAC System, 24590-WTP-RPT-ENG-02-002, Rev. A, dated November 15, 2002, are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]  
  
c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]  
  
d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]
- 30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the WDOH Code Compliance Matrix for PTF HVAC System, 24590-WTP-RPT-

ENG-02-002, Rev. A, dated November 15, 2002 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, dampers, ductwork, and indication devices. [WAC 246-247-120]

- 31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]
- 32) The total radioactivity feed to the WTP Pretreatment Facility from sources exterior to the WTP (that is, the sum of Waste Streams SVS103 and SVS116) shall not exceed 1.1E+08 curies/year. [WAC 246-247-030(5); WAC 246-47-110 (10)]
- 33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]
- 34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]
- 35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

- 36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]
- 37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080(7)]
- 38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:
  - provide critical operating parameters;
  - develop acceptable operating ranges;
  - develop operating procedures to monitor and maintain these parameters;
  - provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

- 39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission

control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

- 40) The differential pressure across each filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

- 41) Prior to cold commissioning, the USDOE shall provide documentation entering the WDOH for approval to demonstrate that humidity in the airstream to the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]
- 42) Alternate power supplied by the generators shall be available for the exhaust fans upon loss of normal facility electrical power. [WAC 246-247-120]
- 43) Differential pressures shall be monitored between C3 and C5 areas to ensure air flow is from the C3 to C5 areas. [WAC 246-247-120]
- 44) Interlocks shall be in place to prevent operation of the PT-S1 emission unit upon loss of power to the C5 ventilation. [WAC 246-247-120]
- 45) Seal leakage for all two-position Dampers serving between C3 and C5 systems shall be leakage Class 1 per ASME AG-1-1997 with ASME AG-1a 2000 Addenda, Article DA-4131 and mandatory Appendix DA-I. [WAC 246-247-120]
- 46) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. Emission unit PT-S2 shall be continuously monitored with analyses for gross alpha and gross beta/gamma. Radionuclides which contribute 10% of the unabated dose or greater, produce a unabated dose of 0.1mrem/yr, and radionuclides that contribute 25% of the abated dose or greater shall be continuously sampled, analyzed, and reported. This shall include at a minimum Am-241, Cs-137, and Sr-90.

Prior to hot commissioning, a procedure to manage down time or failure time of continuous sampling and monitoring equipment will be developed, and a description of this procedure shall be submitted to WDOH for review and approval. [WAC 246-247-040 (1); WAC 246-247-075]

- 47) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040 (1); WAC 246-247-075]
- 48) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]
- 49) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]

- 50) Volume reduction equipment ("HEPA Compactors") shall not be operated within areas ventilated by emission unit PT-S2 until a demonstration, showing the current emission estimate from this emission unit bounds the emissions from the operation of the HEPA compactors, is presented to WDOH for review and approval. [WAC 246-247-120]
- 51) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

**PROJECT TITLE: STABILIZATION, DEACTIVATION, AND DEMOLITION OF THE  
PLUTONIUM FINISHING PLANT (PFP) ANCILLARY BUILDINGS AND STRUCTURES**

**Date Approved: 14-Aug-02**

**Emission Unit Name: 200 AREA DIFFUSE/FUGITIVE**

**Emission Unit ID 486**

This is a MAJOR, FUGITIVE, non-point source emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: BARCT

ALARACT[WAC 246-247-040(4)]  
BARCT[WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
			Abatement controls as required in the following Conditions and Limitations.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075[3]	Appendix B, Method 114	All radionuclides which could contribute 10% of the potential EDE.	As listed in the following Conditions and Limitations.

**Sampling Requirements:** Existing near-facility monitoring stations.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

06/03/2002 NOC Application/Permit Revision, DOE/RL-2002-32, Rev. 0, received June 3, 2002. Conditions/Limitations issued via AIR 02-807 on August 14, 2002.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 5.90E-06 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 5.90E-06 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).
- 3) **This process is limited to:**  
stabilization/deactivation/demolition activities of the following buildings and structures:



234-ZB, Construction Forces Quonset Hut: Miscellaneous storage for construction forces; no apparent radiological concerns.

Construction forces shed: Miscellaneous storage for construction forces; no apparent radiological concerns.

234-ZC, Waste Drum Storage Facility: Loading dock for waste drums and special nuclear material containers; contains a Radioactive Material Area and a Fixed Contamination Area and is labeled "Contact Radcon".

2715-Z, Oil/Solvent Storage Building: Paint shop (paint, oil, solvent, and drum storage); no apparent radiological concerns.

2731-Z, PR Can Storage Building: Storage of empty flushed plutonium drums; there is a Fixed Contamination Area adjacent to the building.

2734-Z, Gas Cylinder Storage Shed: Gas bottle storage; no apparent radiological concerns.

2734-ZA, Gas Cylinder Storage Shed: Empty gas cylinder storage; there is a Fixed Contamination Area adjacent to the building.

2734-ZB, Gas Cylinder Storage Shed: Breathing air cylinder storage; no apparent radiological concerns.

2734-ZC, Gas Cylinder Storage Shed: P-10 gas supply and P-10 and oxygen cylinder storage; no apparent radiological concerns.

2734-ZD, Gas Cylinder Storage Shed: Empty non-flammable cylinder storage; no apparent radiological concerns.

2734-ZF, Gas Cylinder Storage Shed: Standby gas bottle storage (not in use); there is a Fixed Contamination Area and a Radioactive Material Area adjacent to the building.

2734-ZG, Gas Cylinder Storage Shed: Nitrogen gas supply; no apparent radiological concerns.

2734-ZH, Gas Cylinder Storage Shed: Argon bottle supply (not in use); no apparent radiological concerns.

2734-ZJ, Liquid Nitrogen Storage Pad and Tank: Liquid nitrogen storage tank; no apparent radiological concerns.

2734-ZK, Gas Cylinder Storage Shed: Gas bottle storage for acetylene, argon, and propane.

2734-ZL, Hydrogen Fluoride Facility: Hydrogen fluoride gas bottles and supply piping (not in use); potentially internally contaminated systems within the facility; up to 500 dpm/100 cm<sup>2</sup> has been detected in the supply lines in the past.

PPSL Office Annex: There is a potential for contamination in areas that will be uncovered.

MO-834, -839: Mobile office buildings with lunchrooms and offices; no apparent radiological concerns.

Connex Boxes: Miscellaneous storage of maintenance supplies, filters, hardware and components, and oils; unless used for radioactive material storage, there are no apparent radiological concerns.

Construction Forces Laydown Yard: Miscellaneous hardware and components; no apparent radiological concerns.

2735-Z, Bulk Chemical Storage Tanks; the overflow tank is posted as "internally contaminated Systems within".

241-ZB, Bulk Chemical Storage Tank: This tank was used for supplying NaOH to 241-Z. The entire tank is painted as having fixed contamination.

2902-Z, Elevated Water Storage Tank and Tower: No apparent radiological concerns.

2904-ZA, Liquid Effluent Monitoring Station.

2904-ZB, Liquid Effluent Monitoring Station.

Abandoned Steam Line in North Corner (in Isolation Zone): No apparent radiological concerns.

#### STABILIZATION/DEACTIVATION/DEMOLITION ACTIVITIES

All work will be performed in accordance with the approved radiological control methods and as low as reasonably achievable (ALARA) program requirements. These requirements shall be carried out through the activity work packages and associated radiological work permits.

Roofs and walls of the permanent buildings and structures will be removed to slab with the foundation remaining. Utilities will be isolated where required and will involve a minimal amount of excavation. As appropriate, connex boxes and existing materials in laydown areas will be recycled, reused, or disposed.

Demolition methods will be selected based on the structural elements to be demolished, remaining radionuclide contamination, location, and integrity of the structures. Demolition methods could include use of an excavator with a hoe-ram, a hydraulic shear with steel shear jaws, concrete pulverizer/breaker jaws, cutters, or mechanical/power saws. Heavy equipment could be used to demolish permanent structures. Heavy equipment such as a truck-mounted excavator with bucket and thumb attachment could be used to demolish the walls and roofs of the structures. As appropriate, dust suppressants shall be used.

Once the structure is brought completely to the ground, heavy equipment such as a front-end loader and the excavator can be used to load the debris into disposal transport trucks (e.g., roll on/roll off boxes or dump trucks). Potentially, disturbed areas would be leveled and stabilized.

If used during these activities, the sitewide Guzzler(tm), a portable temporary radioactive air emissions unit (PTRAEU) exhaustor, or high-efficiency particulate air (HEPA) filtered vacuum radioactive air emission unit would be used in accordance with the latest revisions of the NOCs ["Categorical Notice of Construction for use of the Guzzler Vacuum Excavation System for Radiologically Limited Activities on the Hanford Site" or 'Guzzler NOC', DOE/RL-96-75 and DOE/RL-97-50 respectively].

Minor amounts of excavation might take place in the vicinity of the permanent structures to support site stabilization and isolating/blanking utilities. Access to underground piping and cable would be gained by use of an excavator. Manual digging methods with shovels, picks, and rakes also could be used. Contaminated soil removed during excavation activities will be covered until replaced into the hole or otherwise dispositioned.

Excavation activities will be monitored and evaluated. The sitewide Guzzler could be used when evidence of low levels of soil contamination is provided. Backfill will be made with the original material removed or brought in 'clean' soil.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Pu - 239            5.30E-04

- 5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- 7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 10) The facility must be able to demonstrate workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose

standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

- 17) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

- 18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
- 21) Diffuse/fugitive emissions shall be monitored using the 200 Area near-field ambient air monitors. Sample collection and analysis shall follow that of the near field monitoring program. Analytical results shall be reported in the Annual Air Emissions Report. Any change to this near-field ambient monitoring program must be approved by the department.
- 22) The following controls shall be used during the stabilization/deactivation/demolition activities.
  1. Health physics technician (HPT) coverage will be provided, as required, in areas where suspect radiological contamination might be encountered. The radiological work procedures provide direction for when HPT coverage is required.
  2. Appropriate controls such as water, fixatives, covers, containment tents, or windscreens will be applied, if needed, as determined by the Health Physics organization. Contaminated soil removed during excavation activities will be covered until replaced into the hole or otherwise dispositioned.

3. After leveling, the soil surface radiological contamination levels will be verified to be acceptable per Radiological Engineering guidelines. If contamination is present above identified levels, the soil will be removed and containerized for disposal or covered or fixed to provide containment of the contamination, consistent with radiological work procedures in effect at the time.
4. As appropriate, before starting work on isolating utilities and piping or dismantling exhaust systems, removable contamination in the affected area(s) will be reduced to ALARA. Measures such as expandable foam, fixatives, or glovebags also could be used to help reduce contamination.
5. If a Guzzler, PTRAEU, or HEPA filtered vacuum radioactive air emission unit is used, controls as approved in the latest revision of the Conditions and Limitations shall apply.
6. If field surveys during excavation identify localized areas of contamination greater than the gross levels (i.e., 500 dpm/100 cm<sup>2</sup> alpha), additional surveys will be conducted on the perimeter of the 'hot spot' to verify the localized nature, ensuring that the overall assumed contamination level is not exceeded.

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

**PROJECT TITLE: STABILIZATION OF TWO CONCRETE BOXES CONTAINING ION  
EXCHANGE COLUMNS IN 183-KW VAULT**

**Date Approved: 26-Aug-02**

**Emission Unit Name: 100 AREA DIFFUSE/FUGITIVE EMISSIONS      Emission Unit ID   689**

[this is a MINOR, FUGITIVE, non-point source emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: **BARCT**

ALARACT [WAC 246-247-040(4)]  
BARCT [WAC 246-247-040(3)]

<u>Zone or Area:</u>	<u>Abatement Technology</u>	<u>Required # of Units</u>	<u>Additional Description/Conditions</u>
			Abatement controls as required in the following Conditions and Limitations.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

<u>Federal and State Regulatory</u>	<u>Monitoring and Testing Procedure</u>	<u>Radionuclides Requiring Measurement</u>	<u>Sampling Frequency</u>
WAC 246-247-075[3]	Appendix B, Method 114(3)	All radionuclides which could contribute 10% of the potential EDE.	As listed in the following Conditions and Limitations.

**Sampling Requirements:** Existing near-facility monitoring stations.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

07/25/2002 NOC received July 25, 2002 and approved via AIR 02-810 on August 26, 2002.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 3.72E-04 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 3.72E-03 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).
- 3) **This process is limited to:**  
stabilization of two concrete boxes containing ion exchange columns in 183-KW vault. This will involve:

rinted on 26-Aug-02

- \* Opening doors to the vault and using a loader to pull each of the two railcars (with an existing concrete box staged on top), just outside of the vault for initial staging. The area around both railcars will be secured with temporary fencing and appropriate radiological posting(s).

NOTE: The area within the vault is not a contamination area, only a high radiation area, therefore it is not likely that the opening of the doors or moving of the railcars will result in any airborne emissions. In addition, the "vault" is not a sealed building. On the west side of the building, the doors are not touching the ground, but rather are high enough to allow the railroad track to extend underneath the doors. Workers routinely access the building through a pedestrian door on the north side.

- \* Drill approximately 20 holes two inches in depth and approximately one inch in diameter into the concrete lids of each box for mounting the flanges, which will support the grout valves, and for securely mounting the hole-drill onto each box, and bolting both flanges and drill equipment into place.
- \* Drill three to five access points, approximately two inches in diameter into the top of each concrete box and insert valves, which will be needed to pump grout into each box or for venting of displaced air.
- \* Attach high-efficiency particulate air (HEPA)-type filtration to the outlet valve on each box. This Nucfil\* system is certified by the vendor as HEPA grade.
- \* The concrete lid for each box rests on top of a gasket by means of gravity; therefore, each lid will be strapped down to the railcar prior to any grouting activities.
- \* Stabilize the ion exchange columns in the concrete boxes by filling the space within each box with an inert material (e.g., cementitious grout or other suitable material). The boxes will be partially grouted after being moved just outside of the vault on the west side of the 183-KW Building.
- \* The rails will then be checked, prior to pulling the railcars and boxes to the loading area on the south side of the 183-KW Building.
- \* Utilizing cranes, each partially grouted concrete box will then be lifted off the railcar and onto a transport trailer, where final grouting will be completed prior to transport. The area around the railcars and boxes during final grouting will also be posted with the appropriate radiological controls.
- \* Once final grouting has been completed, all valves will be closed, then the grouting pipe, but not the valves, will be removed.
- \* HEPA-type filtration and tubing will also be removed upon completion of stabilization, and after the closing of the vent valve.
- \* Each grouted concrete box will then be tied-down and transported to the Low-Level Burial Grounds according to an approved transportation plan.

- \* Any other waste generated during this activity will also be disposed of following established waste management procedures.
- \* A total of 39 spent ion exchange columns, containing varying quantities of radionuclides, currently stored in two concrete boxes in the 183-KW Vault. One of the boxes contains 33 columns, and the other contains six columns. No other waste is known to have been added to the boxes.
- \* The internal dimensions of each box are 24 feet long by 10 feet wide and 6 feet ten inches deep, for an internal volume of 1,639 cubic feet.
- \* The walls of each box are four inches thick, with the bottom being made of plate steel approximately 1/4 inch thick and each box lid being five inches thick.
- \* The concrete structural components of each box are reinforced with rebar.
- \* Each concrete box presently sits on a railroad flatcar.
- \* Records indicate that prior to placing the ion exchange columns in the boxes, each column was drained and plugged. The outside of each column was then sprayed with sealant and wrapped in plastic.
- \* Each column weighs approximately 800 pounds.
- \* The density of the concrete grout is approximately 112-pounds/cubic foot.
- \* There are no access ports into the boxes at this time; therefore, access points must be drilled into the lids and inlet and outlet valves installed.
- \* Both boxes are staged within a High Radiation Area due to the dose rates associated with each. No removable radiological contamination has been found on the outside of either box or on either railcar.
- \* Both concrete boxes must be grouted before burial to provide for waste stabilization during transport.

The following controls are required for these activities:

- \* The hole drilling activity to install the grout ports into place on top of each box has the potential to generate radioactive particulate dust, but this will be minimized by spraying the work area with water during all drilling.
- \* The bit used for drilling each grout port will be dropped into the concrete box after each penetration of the lid to avoid any potential for the spread of contamination.
- \* The other drilling, to bolt the flanges and drill equipment into place on top of each box will be suppressed with the use of water during all drilling to avoid any potential for the spread of contamination.



- \* The grout valves will only be open during installation of each valve, and during the addition of grout to each concrete box. The grout will be pumped into each box in a minimum of three lifts and a maximum of six lifts.

NOTE: The decay heat generation was considered and there will not be an issue with high heat generation or steam generation during curing. The thermal effect will be minimal and pressurization will not be a concern.

- \* The lids for each box will be strapped down prior to adding the grout to ensure that the lids cannot be lifted due to ion exchange column buoyancy.
- \* Each box will be filled in a minimum of three lifts to minimize movement of the columns.
- \* Tubing and HEPA-type filters (in parallel) will be attached to an outlet valve prior to the grouting process. Vapors displaced from within each box, during void space filling, will pass through the outlet valve, tubing and attached HEPA-type filter bank.
- \* Once stabilization of the boxes is complete, the inlet and outlet grout valves on each box will be closed, and will remain in place on top of each box.
- \* The HEPA-type filter banks and tubing will be bagged for disposal. The vent outlet valve will be closed, then the HEPA-type filters and tubing will be removed and the bag will be closed with them inside.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Am - 241	1.09E+00	Am - 242 m	1.52E-02	Cm - 243	2.12E-05
Cm - 244	6.89E-02	Co - 60	4.85E-02	Cs - 137	5.34E+02
Eu - 152	5.36E-01	Eu - 154	1.72E-01	Eu - 155	6.45E-01
H - 3	4.43E+02	Ni - 63	1.92E-01	Pm - 147	1.22E+01
Pu - 238	3.61E-01	Pu - 239	7.33E-01	Pu - 240	3.88E-01
Pu - 241	3.19E+01	Sb - 125	8.54E-01	Sm - 151	7.46E+00
Sr - 90	9.21E+02	Tc - 99	9.82E-02	U - 234	5.81E-04
U - 235	2.17E-05	U - 238	4.70E-04		

- These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- The facility must be able to demonstrate that workers associated with this emission unit are trained in

the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

- 10) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
- 11) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 12) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 13) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 14) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 15) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).
- 16) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting, requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

- 17) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 18) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 19) The facility shall make available, in timely manner, all documents requested by the department for

review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

20) Sampling shall be in accordance with the near field ambient sampling program.

**DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR**

**PROJECT TITLE: INSTALLATION OF SINGLE STAGE HEPA FILTER FOR THE  
CALIBRATION AND DEVELOPMENT ACTIVITIES IN THE RADIOLOGICAL CALIBRATIONS  
LABORATORY (318 BUILDING)**

Emission Unit Name: EP-318-01-S

Emission Unit ID 175

This is a MINOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]

BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
Exhaust Duct	HEPA	1	12" x 24" x 24" HEPA filter installed in the exhaust duct from the fume hood in Room 126.
Exhaust Duct	Exhaust Fan	1	

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93(b)[4][i] & WAC 246-247-075[3]	Appendix B, Method 114(3)	Total Alpha and Total Beta	2 week sample/year

Sampling Requirements: Record Sample

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

09/20/2002 NOC received September 20, 2002. This NOC supercedes, as well as obsoletes NOC 251, this NOC supercedes NOC 131 which was obsoleted on July 24, 2001. NOC approved via AIR 02-1228 on December 23, 2002.

09/12/2003 Conditions and Limitations, AIR 03-1204, mailed on December 8, 2003 to reflect current appeal language agreed upon on September 12, 2003.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 1.72E-05 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)).
- 3) **This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in WAC 246-247-030(16), may be conducted.**

To install a single stage HEPA filter into the exhaust flow duct from the fume hood in Room 126. This

modification is in support of the calibration and repair of contaminated equipment that will take place in the fume hood once the HEPA filter is installed. These activities currently are performed in the glove box in Room 131.

The 318 Building provides technical services such as internal dosimetry, external dosimetry, instrument calibration, repair, and testing in support of the Hanford and DOE missions. Research capabilities are also provided to support the development of radiation detection and measuring instruments.

- 4) The PTE for this project as determined under WAC 246-247-030(21)(a-c) [as specified in the application] is 1.72E-05 mrem/year. Approved are the associated potential release rates (Curies/year) of:

Alpha - 0                      1.70E-06              Liquid/Particulate Solid              WAC 246-247-030(21)(a)  
Alpha release rate based on Am-241/Pu-239.

B/G - 0                      4.50E-07              Liquid/Particulate Solid              WAC 246-247-030(21)(a)  
Beta/gamma release rate based on Cs-137/Sr-90.

The radioactive isotopes identified for this emission unit are (no quantities specified):

Am -241	Ba - 133	Co -57
Co -60	Cs -137	Eu -154
Eu -155	H -3	Hg -203
Kr -85	Mn -54	Na -22
Pu -239	Ra -226	Rn -220
Rn -222	Sb -125	Sr -90
Th -228	U(Nat) -0	Y -88

The potential release rates described in this Condition were used to determine control technologies and monitoring requirements for this approval. DOE must notify the Department of a "modification" to the emission unit, as defined in WAC 246-247-030(16). DOE must notify the Department of any changes to a NESHAP major emission unit when a specific isotope is newly identified as contributing greater than 10% of the potential TEDE to the MEL, or greater than 25% of the TEDE to the MEL after controls. WAC 246-247-110(9). DOE must notify the Department of any changes to potential release rates as required by state or federal regulations including changes that would constitute a significant modification to the Air Operating Permit under WAC 173-401-725(4). Notice will be provided according to the particular regulation under which notification is required. If the applicable regulation(s) does not address manner and type of notification, DOE will provide the Department with advance written notice by letter or electronic mail but not solely by copies of documents.

- 5) The radionuclides in the Annual Possession Quantity are limited to the following physical forms:

Gas: H-3, Kr-85, Rn-220, Rn-222

Solid: Am-241, Ba-133, Co-57, Co-60, Cs-137, Eu-154, Eu-155, Hg-203, Mn-54, Na-22, Pu-239, Sb-125, Sr-90, U(Nat), Y-88,

Particulates: Ra-226,Th-228

- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-040(5) and WAC 246-247-060(5)).

- 7) The facility shall notify the department at least seven calendar days prior to any planned preoperational tests of new or modified emission units that involve emissions control, monitoring, or containment systems of the emission unit(s). The department reserves the right to witness or require preoperational tests involving the emissions control, monitoring, or containment systems of the emissions unit(s) (WAC 246-247-060(4)).
- 8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 10) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 11) All facilities must be able to demonstrate the reliability and accuracy of emissions monitoring data (WAC 246-247-075(13)).
- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall notify the department within twenty-four hours of any shutdown, or of any transient abnormal condition lasting more than four hours or other change in facility operations which, if allowed to persist, would result in emissions of radioactive material in excess of applicable standards or license requirements (WAC 246-247-080(5)).
- 17) The licensee is not required to conduct the monitoring and associated recordkeeping for any emission unit if the emission unit did not operate at any time between required monitoring events (e.g., if the monitoring requires continuous sampling, such readings would not be required on any full day in which the emission unit did not operate), provided the following conditions are met: In the case of permanent shutdown of the emission unit: (i) the licensee completes the monitoring and associated recordkeeping for that period prior to the shutdown. (ii) the licensee files a report of closure with the Department of Health in accordance with WAC 246-247-080(6). An emission unit will not be considered to be permanently shut down or completed until a report of closure is received by the

Department of Health (WAC 246-247-080(6)).

- 18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
- 21) **This condition was obsoleted on 9/12/2003.** These Conditions and Limitations must be documented in an established procedure(s) prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).  
*Obsoleted by appeal language agreed upon on September 12, 2003.*
- 22) HEPA filters shall be individually tested, annually, to the requirements of ASME N510, and shall have a minimum efficiency of 99.95%.
- 23) The emission unit monitoring system shall have the following activities performed:
  - a. The USDOE shall provide to DOH for review copies of the procedures used to perform the functional/calibration checks and visual inspection activities; and
  - b. A functional/calibration check of monitoring system instrumentation shall be performed annually.

Within two years of this approval:

- c. A visual check of nozzle position and orientation;
  - d. A check to ensure the tightness of all fittings and connections;
  - e. A visual check of the sample line, around the area of the sample filter, for corrosion and line losses. This requirement is limited to the sample filter area only.
- 24) **This condition was obsoleted on 9/12/2003.** If a proposed modification to the annual possession quantity increases the Potential-to-Emit TEDE by 0.1 mrem/year or greater, or the sum of the Potential-to-Emit TEDEs from all modifications and the already approved NOC is  $1.72E-05$  mrem/year or greater, the facility must seek approval from the department prior to implementing the modification.

- If a proposed modification to the annual possession quantity increases the Potential-to-Emit TEDE by less than 0.1 mrem/year and the sum of the Potential-to-Emit TEDEs from all modifications and the already approved NOC is less than  $1.72 \times 10^{-5}$  mrem/year, the facility may implement the modification. The facility must report the modification(s) to the department via the annual report.

*Obsoleted via current appeal language agreed upon on September 12, 2003.*



DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

**PROJECT TITLE: INSTALLATION OF BREATHER FILTER ON TANK 241-C-106**

**Date Approved: 07-Feb-03**

**Emission Unit Name: 200 AREA DIFFUSE/FUGITIVE**

**Emission Unit ID 486**

This is a MAJOR, FUGITIVE, non-point source emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: **BARCT**

ALARACT [WAC 246-247-040(4)]

BARCT [WAC 246-247-040(3)]

<u>Zone or Area:</u>	<u>Abatement Technology</u>	<u>Required # of Units</u>	<u>Additional Description/Conditions</u>
			Abatement controls as required in the following Conditions and Limitations.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

<u>Federal and State Regulatory</u>	<u>Monitoring and Testing Procedure</u>	<u>Radionuclides Requiring Measurement</u>	<u>Sampling Frequency</u>
WAC 246-247-075[3]	Appendix B, Method 114	All radionuclides which could contribute 10% of the potential TEDI.	As listed in the following Conditions and Limitations.

**Sampling Requirements:** Existing near-facility monitoring stations.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

10/07/2002 NOC DOE/RL-2002-53, received October 7, 2003. Approved on February 7, 2003 via AIR 03-203.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 2.80E-04 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 2.80E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).
- 3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**  
the construction of a new emission unit by the installation of a breather filter on Tank 241-C-106 in preparation for the deactivation of 296-P-16 and to register the existing breather filters on Tanks 241-C-

104 and 241-C-105. A section of the active ventilation system ducting shall be removed to disconnect Tanks 241-C-105 and 241-C-106 from 296-P-16 ventilation system.

During installation of this breather filter the following ALARACT agreements shall be used:

ALARACT 1 "Demonstration for the Riser preparation/Opening"

ALARACT 16 "Demonstration for Work on Potentially Contaminated Ventilation System Components."

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Ac - 227	1.09E+02	Am - 241	7.76E+03	Am - 243	3.15E-01
Ba - 137 m	1.84E+05	C - 14	2.41E+00	Cd - 113 m	3.73E+01
Cm - 242	6.12E+00	Cm - 243	4.67E-01	Cm - 244	1.56E+01
Co - 60	3.60E+02	Cs - 134	1.16E-01	Cs - 137	1.95E+05
Eu - 152	5.85E+00	Eu - 154	1.37E+03	Eu - 155	9.98E+02
H - 3	5.82E+01	I - 129	8.64E-01	Nb - 93 m	2.28E+01
Ni - 59	1.11E+01	Ni - 63	1.04E+03	Np - 237	4.66E+00
Pa - 231	2.39E+02	Pu - 238	2.61E+02	Pu - 239	7.61E+03
Pu - 240	1.41E+03	Pu - 241	1.67E+04	Pu - 242	1.05E-01
Ra - 226	6.68E-03	Ra - 228	2.26E+01	Ru - 106	1.98E-04
Sb - 125	1.80E+02	Se - 79	6.70E+00	Sm - 151	2.14E+04
Sn - 126	3.88E+00	Sr - 90	1.24E+06	Tc - 99	1.43E+02
Th - 229	9.41E-01	Th - 232	5.58E+00	U - 232	1.93E+01
U - 233	4.13E+02	U - 234	2.41E+01	U - 235	7.42E-01
U - 236	7.40E-01	U - 238	1.50E+01	Y - 90	1.24E+06
Zr - 93	2.62E+01				

- 5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- 7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 10) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).

- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).
- 17) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

- 18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

- 21) Diffuse/Fugitive emissions shall be monitored using the 200 Area near-field ambient air monitors. Sample collection and analysis shall follow that of the near field monitoring program. Analytical results shall be reported in the Annual Air Emissions Report. Any change to this near-field ambient monitoring program must be approved by the department.

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

**PROJECT TITLE: INSTALLATION OF BREATHER FILTER ON TANK 241-C-106**

**Date Approved: 07-Feb-03**

**Emission Unit Name: C106**

**Emission Unit ID 712**

This is a MINOR, PASSIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: ALARACT

ALARACT [WAC 246-247-040(4)]  
BARCT [WAC 246-247-040(3)]

<u>Zone or Area:</u>	<u>Abatement Technology</u>	<u>Required # of Units</u>	<u>Additional Description/Conditions</u>
	HEPA		Single Passive HEPA Filter

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

<u>Federal and State Regulatory</u>	<u>Monitoring and Testing Procedure</u>	<u>Radionuclides Requiring Measurement</u>	<u>Sampling Frequency</u>
WAC 246-247-075[3]		Levels below 10,000 dpm/100cm <sup>2</sup> beta/gamma and 200 dpm/100cm <sup>2</sup> alpha will verify low emissions.	1 per year

**Sampling Requirements:** PCM will be a smear survey on the inside surface of the ducting and downstream of the HEPA filter or on the outside of the screen covering the outlet of the vent.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

10/07/2002 NOC, DOE/RL-2002-53, received October 7, 2003. Approved on February 7, 2003 via AIR 03-203.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 2.80E-04 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 2.80E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).
- 3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**  
the construction of a new emission unit by the installation of a breather filter on Tank 241-C-106 in

preparation for the deactivation of 296-P-16 and to register the existing breather filters on Tanks 241-C-104 and 241-C-105. A section of the active ventilation system ducting shall be removed to disconnect Tanks 241-C-105 and 241-C-106 from 296-P-16 ventilation system.

During installation of this breather filter the following ALARACT agreements shall be used:

ALARACT 1 "Demonstration for the Riser preparation/Opening"

ALARACT 16 "Demonstration for Work on Potentially Contaminated Ventilation System Components."

**4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Ac - 227	2.31E-03	Am - 241	2.25E+02	Am - 243	2.20E-03
Ba - 137 m	1.66E+04	C - 14	5.73E-02	Cd 113 m	1.77E+01
Cm - 242	3.56E-01	Cm - 243	2.81E-02	Cm 244	6.03E-01
Co - 60	1.40E+00	Cs - 134	7.07E-02	Cs 137	1.75E+04
Eu - 152	3.28E+00	Eu - 154	2.67E+02	Eu 155	1.89E+02
H - 3	1.55E+00	I - 129	1.70E-02	Nb - 93 m	1.28E+01
Ni - 59	6.53E+00	Ni - 63	6.08E+02	Np - 237	2.62E-01
Pa - 231	3.37E-03	Pu - 238	3.50E+00	Pu - 239	7.56E+01
Pu - 240	1.54E+01	Pu - 241	1.85E+02	Pu - 242	1.65E-03
Ra - 226	4.10E-04	Ra - 228	3.15E-05	Ru - 106	1.69E-05
Sb - 125	2.83E+00	Se - 79	2.88E-01	Sm - 151	1.19E+04
Sn - 126	2.14E+00	Sr - 90	2.82E+05	Tc - 99	3.14E+00
Th - 229	2.43E-05	Th - 232	2.54E-03	U - 232	5.30E-04
U - 233	2.18E-03	U - 234	4.31E-02	U - 235	1.84E-03
U - 236	7.66E-04	U - 238	4.40E-02	Y - 90	2.82E+05
Zr - 93	1.44E+01				

- 5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- 7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 10) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test

results from this emission unit (WAC 246-247-075(13)).

- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).
- 17) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

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All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

- 18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
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appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).



DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

**PROJECT TITLE: INSTALLATION OF BREATHER FILTER ON TANK 241-C-106**

**Date Approved: 07-Feb-03**

**Emission Unit Name: C104**

**Emission Unit ID 716**

This is a MINOR, PASSIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: **BARCT**

ALARACT [WAC 246-247-040(4)]

BARCT [WAC 246-247-040(3)]

<u>Zone or Area:</u>	<u>Abatement Technology</u>	<u>Required # of Units</u>	<u>Additional Description/Conditions</u>
	HEPA		Single Passive HEPA Filter

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

<u>Federal and State Regulatory</u>	<u>Monitoring and Testing Procedure</u>	<u>Radionuclides Requiring Measurement</u>	<u>Sampling Frequency</u>
WAC 246-247-075(3)		Levels below 10,000 dpm/100cm <sup>2</sup> beta/gamma and 200 dpm/100cm <sup>2</sup> alpha will verify low emissions.	1 per year

**Sampling Requirements:** PCM will be a smear survey on the inside surface of the ducting and downstream of the HEPA filter or on the outside of the screen covering the outlet of the vent.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

10/07/2002 NOC, DOE/RL-2002-53, received October 7, 2003. Approved on February 7, 2003 via AIR 03-203.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 2.80E-04 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 2.80E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).
- 3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**  
the construction of a new emission unit by the installation of a breather filter on Tank 241-C-106 in

preparation for the deactivation of 296-P-16 and to register the existing breather filters on Tanks 241-C-104 and 241-C-105. A section of the active ventilation system ducting shall be removed to disconnect Tanks 241-C-105 and 241-C-106 from 296-P-16 ventilation system.

During installation of this breather filter the following ALARACT agreements shall be used:

ALARACT 1 "Demonstration for the Riser preparation/Opening"

ALARACT 16 "Demonstration for Work on Potentially Contaminated Ventilation System Components."

**4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Ac - 227	1.09E+02	Am - 241	6.34E+03	Am - 243	3.12E-01
Ba - 137 m	9.03E+04	C - 14	1.85E+00	Cd - 113 m	1.93E+01
Cm - 242	5.38E+00	Cm - 243	4.31E-01	Cm - 244	1.50E+01
Co - 60	2.72E+02	Cs - 134	4.50E-02	Cs - 137	9.55E+04
Eu - 152	2.43E+00	Eu - 154	1.10E+03	Eu - 155	8.05E+02
H - 3	5.61E+01	I - 129	7.54E-01	Nb - 93 m	9.90E+00
Ni - 59	4.58E+00	Ni - 63	4.29E+02	Np - 237	4.39E+00
Pa - 231	2.39E+02	Pu - 238	2.27E+02	Pu - 239	5.47E+03
Pu - 240	1.08E+03	Pu - 241	1.48E+04	Pu - 242	9.49E-02
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Th - 229	9.41E-01	Th - 232	5.58E+00	U - 232	1.93E+01
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U - 236	6.84E-01	U - 238	1.17E+01	Y - 90	4.84E+05
Zr - 93	1.17E+01				

- 5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- 7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
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- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
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results from this emission unit (WAC 246-247-075(13)).

- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart II (WAC 246-247-080(2)).
- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).
- 17) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

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appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

**DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR**

**PROJECT TITLE: INSTALLATION OF BREATHIER FILTER ON TANK 241-C-106**

**Date Approved: 07-Feb-03**

**Emission Unit Name: C105**

**Emission Unit ID 717**

This is a MINOR, PASSIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: **BARCT**

ALARACT [WAC 246-247-040(4)]

BARCT [WAC 246-247-040(3)]

<u>Zone or Area:</u>	<u>Abatement Technology</u>	<u>Required # of Units</u>	<u>Additional Description/Conditions</u>
	HEPA		Single Passive HEPA Filter

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

<u>Federal and State Regulatory</u>	<u>Monitoring and Testing Procedure</u>	<u>Radionuclides Requiring Measurement</u>	<u>Sampling Frequency</u>
WAC 246-247-075(3)		Levels below 10,000 dpm/100cm <sup>2</sup> beta/gamma and 200 dpm/100cm <sup>2</sup> alpha will verify low emissions.	1 per year

**Sampling Requirements:** PCM will be a smear survey on the inside surface of the ducting and downstream of the HEPA filter or on the outside of the screen covering the outlet of the vent.

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**Change History**

10/07/2002 NOC, DOE/RL-2002-53, received October 7, 2003. Approved on February 7, 2003 via AIR 03-203.

**CONDITIONS AND LIMITATIONS**

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preparation for the deactivation of 296-P-16 and to register the existing breather filters on Tanks 241-C-104 and 241-C-105. A section of the active ventilation system ducting shall be removed to disconnect Tanks 241-C-105 and 241-C-106 from 296-P-16 ventilation system.

During installation of this breather filter the following ALARACT agreements shall be used:

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ALARACT 16 "Demonstration for Work on Potentially Contaminated Ventilation System Components."

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Ba - 137 m	7.74E+04	C - 14	5.07E-01	Cd - 113 m	3.13E-01
Cm - 242	3.81E-01	Cm - 243	7.87E-03	Cm - 244	1.20E-02
Co - 60	8.63E+01	Cs - 134	3.56E-04	Cs - 137	8.18E+04
Eu - 152	1.42E-01	Eu - 154	9.06E-01	Eu - 155	4.28E+00
H - 3	5.85E-01	I - 129	9.30E-02	Nb - 93 m	1.06E-01
Ni - 59	3.53E-02	Ni - 63	3.18E+00	Np - 237	5.61E-03
Pa - 231	3.55E-05	Pu - 238	3.05E+01	Pu - 239	2.06E+03
Pu - 240	3.14E+02	Pu - 241	1.68E+03	Pu - 242	8.94E-03
Ra - 226	2.82E-06	Ra - 228	1.41E-10	Ru - 106	7.41E-09
Sb - 125	2.51E-02	Se - 79	2.64E-03	Sm - 151	8.99E+01
Sn - 126	1.63E-02	Sr - 90	4.76E+05	Tc - 99	8.14E+01
Th - 229	5.11E-08	Th - 232	2.91E-11	U - 232	1.58E-04
U - 233	5.65E-06	U - 234	3.21E+00	U - 235	1.37E-01
U - 236	5.56E-02	U - 238	3.29E+00	Y - 90	4.76E+05
Zr - 93	1.24E-01				

- 5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- 7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 10) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test

results from this emission unit (WAC 246-247-075(13)).

- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).
- 17) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

- 18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the

appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).



DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

**PROJECT TITLE: LIQUID PUMPING AND ENHANCED SLUICING ON TANK 241-C-106**

**Emission Unit Name: 200 AREA DIFFUSE/FUGITIVE**

**Emission Unit ID 486**

This is a MAJOR, FUGITIVE, non-point source emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]  
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
			Abatement controls as required in the following Conditions and Limitations.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075[3]	Appendix B, Method 114	All radionuclides which could contribute 10% of the potential TEDE.	As listed in the following Conditions and Limitations.

**Sampling Requirements:** Existing near-facility monitoring stations.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

- 11/21/2002 NOC, Modification for Liquid Pumping and Enhanced Sluicing on Tank 241-C-106, approved via AIR 02-1107 on November 25, 2002. Approval of this NOC obsoletes NOC 310, 241-C-106 Tank Sluicing, Phase II.
- 12/18/2002 AOP Minor Permit Modification received December 17, 2002. No new Conditions/Limitations mailed.
- 01/28/2003 NOC Revision approved on January 28, 2003 to provide changes to sections 3 and 6 and to Appendix C. No new Conditions/Limitations provided.
- 11/05/2003 NOC application revision, revision 6, received November 5, 2003 to provide a change in the process description. Approved via AIR 03-1102, mailed on November 10, 2003.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 2.55E-03 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 4.67E+00 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).

- 3) **This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in WAC 246-247-030(16), may be conducted.**

The following actions:

**Step 1:**

- Fix and/or remove contamination and blown in soil/debris in the 241-C-06B heel pit in accordance with ALARACT 4, ALARACT 6, ALARACT 14, and ALARACT 15.
- If necessary, a HEPA vacuum will be used in accordance with the sitewide NOC.
- Remove a heel pit pump out of riser R-13 in the 241-C-06B heel pit in accordance with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15, and ALARACT 16.
- Place conduit in a trench in accordance with ALARACT 5.
- Remove a thermocouple out of riser R-14 in accordance with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15, and ALARACT 16.
- Install slurry pump for the sluicing operation in riser R-9, R-13 or R-14 in accordance with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15 and ALARACT 16.

**Step 2:**

- Fix and/or remove any contamination and blown in soil/debris in the 241-C-06C sluice pit in accordance with ALARACT 4, ALARACT 6, ALARACT 14 and ALARACT 15.
- If necessary, a HEPA vacuum will be used per the sitewide NOC.
- Remove the old sluicer and install new sluicer equipment in the R-3 riser, if needed, in accordance with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15 and ALARACT 16.

**Step 3:**

- Fix and/or remove any contamination and blown in soil/debris in the 241-C-06A pump pit in accordance with ALARACT 4, ALARACT 6, ALARACT 14 and ALARACT 15.
- If necessary, a HEPA vacuum will be used per the sitewide NOC.
- Remove the failed pump equipment out of R-9 and R-6 riser used for prior sluicing operation in accordance with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15 and ALARACT 16.
- Install new sluicer equipment in the R-6, R-7, R-5 or R-9 riser, if needed, with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15 and ALARACT 16, or use the existing project W-320 sluicing nozzle.
- Place an in-tank closed circuit television camera or television monitoring system in riser R-1, R-7, R-8 and R-14 in accordance with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15 and ALARACT 16.
- Install a new sluicer nozzle in R-7 or R-8 and remove an additional thermocouple in accordance with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15 and ALARACT 16.

**Step 4:**

- Pump out remaining free liquid in the tank to the DST system through a pump installed in either riser R-9, R-13 or R-14 under passive ventilation in accordance with ALARACT 11.

Step 5: (applies only to the 296-P-47 emission unit)

- Sluice and pump the solids that become a slurry into the DST system using raw water (or recirculated 241-C-106 water) as the sluicing agent. This activity shall only be performed during operation of the 296-P-47 portable exhauster. The emission unit shall be sampled continuously with a shrouded probe. The sample location, shrouded probe assembly, transport line and sample collection shall be qualified in accordance with the requirements of ANSI N13.1-1999.

Step 6:

- After sluicing an "in tank vehicle" (ITV) could be used, if necessary, to collect the remaining tank contents to be slurried through the sluicing pump to bring the tank contents down to <360 cubic feet in volume. This activity shall only be performed during operation of the 296-P-45 portable exhauster. The ITV shall be installed through a riser in accordance with ALARACT 1 and ALARACT 13. The ITV will be used to push the remaining tank material into the center of the tank to be pumped. The ITV shall not move faster than 2 mph. If big chunks of sludge need to be broken, the tracks or plow blade could be used to break up the material so it can be pumped. The "water cannon" on the ITV shall not be used in tank 241-C-106. Upon removal of the tank the ITV shall be decontaminated with in the tank using ultrasonic decontamination and then go through a spray ring.

4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):

Ac 227	2.31E-03	Am 241	2.25E+02	Am - 243	2.20E-03
Ba - 137 m	1.66E+04	C - 14	5.73E-02	Cd - 113 m	1.00E+00
Cm - 242	3.56E-01	Cm - 243	2.81E-02	Cm - 244	6.03E-01
Co - 60	1.40E+00	Cs 134	7.07E-02	Cs - 137	1.75E+04
Eu 152	3.28E+00	Eu - 154	2.67E+02	Eu - 155	1.89E+02
H 3	1.55E+00	I - 129	1.70E-02	Nb - 93 m	1.28E+01
Ni - 59	6.53E+00	Ni - 63	6.08E+02	Np - 237	2.62E-01
Pa 231	3.37E-03	Pu - 238	3.50E+00	Pu - 239	7.56E+01
Pu 240	1.54E+01	Pu 241	1.85E+02	Pu - 242	1.65E-03
Ra 226	4.10E-04	Ra - 228	3.15E-05	Ru - 106	1.69E-05
Sb 125	2.83E+00	Se - 79	2.88E-01	Sm - 151	1.19E+04
Sn - 126	2.14E+00	Sr - 90	2.82E+05	Tc - 99	3.14E+00
Th - 229	2.43E-05	Th - 232	2.54E-03	U - 232	5.30E-04
U - 233	2.18E-03	U - 234	4.31E-02	U - 235	1.84E-03
U - 236	7.66E-04	U - 238	4.40E-02	Y - 90	2.82E+05
Zr - 93	1.44E+01				

- 5) This condition was obsoleted on 11/10/2003. These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).

*Obsoleted via AIR 03-1102 to update conditions to reflect current appeal language.*

- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-040(5)) and WAC 246-247-060(5)).
- 7) The facility shall notify the department at least seven calendar days prior to any planned preoperational tests of new or modified emission units that involve emissions control, monitoring, or containment systems of the emission unit(s). The department reserves the right to witness or require preoperational tests involving the emissions control, monitoring, or containment systems of the emissions unit(s) (WAC 246-247-060(4)).
- 8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 10) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall notify the department within twenty-four hours of any shutdown, or of any transient abnormal condition lasting more than four hours or other change in facility operations which, if allowed to persist, would result in emissions of radioactive material in excess of applicable standards or license requirements (WAC 246-247-080(5)).
- 17) The facility shall file a report of closure with the department whenever operations producing emissions of radioactive material are permanently ceased at any emission unit (except temporary emission units) regulated under this chapter. The closure report shall indicate whether, despite cessation of operations, there is still a potential for radioactive air emissions and a need for an active or passive ventilation system with emission control and/or monitoring devices. If decommissioning is planned and will constitute a modification, a NOC is required, as applicable, in accordance with WAC 246-247-060. (WAC 246-247-080(6))
- 18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

- 19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
- 21) Diffuse/Fugitive emissions shall be monitored using the 200 East Area near-field ambient air monitors. Sample collection and analysis shall follow that of the near field monitoring program. Analytical results shall be reported in the Annual Air Emissions Report. Any change to this near-field ambient monitoring program must be approved by the department.
- 22) Prior to pump of liquid from 241-C-106 the breather filter shall be verified to be valved open.
- 23) Periodic confirmatory measurements of the breather filter shall be a monthly smear taken on the downstream side of the breather filter, during sluicing operations. Any positive results above background shall be reported to the WDOH.
- 24) The Breather Filter shall be tested annually in-place with a minimum efficiency of 99.95% in accordance with requirements ASME N510 Section 10.
- 25) WDOH approved logs shall be used to track the Annual Possession Quantities for Pit Cover Removal and the abated offsite dose shall not exceed  $5.96\text{E-}06$  mrem/year.
- 26) A WDOH approved log shall be used to track total days of liquid pumping under passive ventilation, and shall not exceed 60 days.
- 27) Total soil excavated shall not exceed 500 cubic feet.
- 28) WDOH approved logs shall be used to track the Annual Possession Quantities for Equipment Removal and the abated offsite dose shall not exceed  $6.3\text{E-}03$  mrem/year.
- 29) WDOH approved logs shall be used to track the Annual Possession Quantities for Soil Excavation and the abated offsite dose shall not exceed  $1.69\text{E-}04$  mrem/year.
- 30) All facilities with licensed emission units, except for radioactive materials licensees, shall submit a request to the department for renewal of their radioactive air emissions license at least sixty days prior to expiration of the license or as required by the Air Operating Permit. All renewal requests shall include a summary of the operational status of all emission units, the status of facility compliance with the standards of WAC 246-247-040, and the status of any corrective actions necessary to achieve compliance with the requirements of this chapter. Facilities with licensed emission units that also hold a radioactive materials license issued by the department shall submit this information along with their radioactive material license renewal submittal. If the department is unable to renew a radioactive air emissions license before its expiration date, the existing license, with all of its requirements and limitations, remains in force until the department either renews or revokes the license (WAC 246-247-060(9)).

- 31) All radioactive air emissions licenses issued by the department, except those issued to radioactive materials licensees, shall have an expiration date of five years from date of issuance or as specified in the Air Operating Permit. For radioactive material licensees, the requirements and limitations for the operation of emission units shall be incorporated into their radioactive materials license, and shall expire when the radioactive materials license expires (WAC 246-247-060(6)).

**DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR**

**PROJECT TITLE: LIQUID PUMPING AND ENHANCED SLUICING ON TANK 241-C-106**

**Emission Unit Name: 296-P-47**

**Emission Unit ID 498**

This is a MAJOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]

BARCT [WAC 246-247-040(3)]

<u>Zone or Area:</u>	<u>Abatement Technology</u>	<u>Required # of Units</u>	<u>Additional Description/Conditions</u>
	Heater		
	Demister		
	Prefilter		
	HEPA		Two HEPA filters in series
	Fan		

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075.

<u>Federal and State Regulatory</u>	<u>Monitoring and Testing Procedure</u>	<u>Radionuclides Requiring Measurement</u>	<u>Sampling Frequency</u>
WAC 246-247-075	40 CFR 61, Appendix B, Method 114, latest revision.	All radionuclides which could contribute 10% of the potential EDE.	Change record sample every 2-weeks during emission unit operation.

**Sampling Requirements:** Continuous during emission unit operation.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

- 11/21/2002 NOC, Modification for Liquid Pumping and Enhanced Sluicing on Tank 241-C-106, approved via AIR 02-1107 on November 25, 2002. Approval of this NOC obsoletes NOC 310, 241-C-106 Tank Sluicing, Phase II.
- 12/18/2002 AOP Minor Permit Modification received December 17, 2002. No new Conditions/Limitations mailed.
- 01/26/2003 NOC Revision approved on January 28, 2003 to provide changes to sections 3 and 6 and to Appendix C. No new Conditions/Limitations provided.
- 11/05/2003 NOC application revision, revision 6, received November 5, 2003 to provide a change in the process description. Approved via AIR 03-1102, mailed on November 10, 2003.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

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- 2) The total abated emission limit for this Notice of Construction is limited to 2.55E-03 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 4.67E+00 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).
- 3) **This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in WAC 246-247-030(16), may be conducted.**

The following actions:

Step 1:

- Fix and/or remove contamination and blown in soil/debris in the 241-C-06B heel pit in accordance with ALARACT 4, ALARACT 6, ALARACT 14, and ALARACT 15.
- If necessary, a HEPA vacuum will be used in accordance with the sitewide NOC.
- Remove a heel pit pump out of riser R-13 in the 241-C-06B heel pit in accordance with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15, and ALARACT 16.
- Place conduit in a trench in accordance with ALARACT 5.
- Remove a thermocouple out of riser R-14 in accordance with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15, and ALARACT 16.
- Install slurry pump for the sluicing operation in riser R-9, R-13 or R-14 in accordance with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15 and ALARACT 16.

Step 2:

- Fix and/or remove any contamination and blown in soil/debris in the 241-C-06C sluice pit in accordance with ALARACT 4, ALARACT 6, ALARACT 14 and ALARACT 15.
- If necessary, a HEPA vacuum will be used per the sitewide NOC.
- Remove the old sluicer and install new sluicer equipment in the R-3 riser, if needed, in accordance with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15 and ALARACT 16.

Step 3:

- Fix and/or remove any contamination and blown in soil/debris in the 241-C-06A pump pit in accordance with ALARACT 4, ALARACT 6, ALARACT 14 and ALARACT 15.
- If necessary, a HEPA vacuum will be used per the sitewide NOC.
- Remove the failed pump equipment out of R-9 and R-6 riser used for prior sluicing operation, in accordance with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15 and ALARACT 16.
- Install new sluicer equipment in the R-6, R-7, R-5 or R-9 riser, if needed, with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15 and ALARACT 16, or use the existing project W-320 sluicing nozzle.
- Place an in-tank closed circuit television camera or television monitoring system in riser R-1, R-7, R-8 and R-14 in accordance with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15 and ALARACT 16.
- Install a new sluicer nozzle in R-7 or R-8 and remove an additional thermocouple in



accordance with ALARACT 1, ALARACT 4, ALARACT 6, ALARACT 13, ALARACT 14, ALARACT 15 and ALARACT 16.

Step 4:

- Pump out remaining free liquid in the tank to the DST system through a pump installed in either riser R-9, R-13 or R-14 under passive ventilation in accordance with ALARACT 11.

Step 5: (applies only to the 296-P-47 emission unit)

- Sluice and pump the solids that become a slurry into the DST system using raw water (or recirculated 241-C-106 water) as the sluicing agent. This activity shall only be performed during operation of the 296-P-47 portable exhauster. The emission unit shall be sampled continuously with a shrouded probe. The sample location, shrouded probe assembly, transport line and sample collection shall be qualified in accordance with the requirements of ANSI N13.1-1999.

Step 6:

- After sluicing an "in tank vehicle" (ITV) could be used, if necessary, to collect the remaining tank contents to be slurried through the sluicing pump to bring the tank contents down to <360 cubic feet in volume. This activity shall only be performed during operation of the 296-P-45 portable exhauster. The ITV shall be installed through a riser in accordance with ALARACT 1 and ALARACT 13. The ITV will be used to push the remaining tank material into the center of the tank to be pumped. The ITV shall not move faster than 2 mph. If big chunks of sludge need to be broken, the tracks or plow blade could be used to break up the material so it can be pumped. The "water cannon" on the ITV shall not be used in tank 241-C-106. Upon removal of the tank the ITV shall be decontaminated with in the tank using ultrasonic decontamination and then go through a spray ring.

4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):

Ac 227	2.31E-03	Am 241	2.25E+02	Am - 243	2.20E-03
Ba 137 m	1.66E+04	C - 14	5.73E-02	Cd - 113 m	1.77E+01
Cm - 242	3.56E-01	Cm - 243	2.81E-02	Cm - 244	6.03E-01
Co - 60	1.40E+00	Cs - 134	7.07E-02	Cs - 137	1.75E+04
Eu - 152	3.28E+00	Eu 154	2.67E+02	Eu - 155	1.89E+02
H 3	1.55E+00	I 129	1.70E-02	Nb - 93 m	1.28E+01
Ni - 59	6.53E+00	Ni - 63	6.08E+02	Np - 237	2.62E-01
Pa - 231	3.37E-03	Pu - 238	3.50E+00	Pu - 239	9.10E+01
Pu - 241	1.85E+02	Pu - 242	1.65E-03	Ra - 226	4.10E-04
Ra 228	3.15E-05	Ru - 106	1.69E-05	Sb - 125	2.83E+00
Se 79	2.88E-01	Sm - 151	1.19E+04	Sn - 126	2.14E+00
Sr - 90	2.82E+05	Tc 99	3.14E+00	Th 229	2.43E-05
Th - 232	2.54E-03	U - 232	5.40E-04	U - 233	2.18E-03
U - 234	4.31E-02	U - 235	1.84E-03	U - 236	7.66E-04
U - 238	4.40E-02	Y 90	2.82E+05	Zr - 93	1.44E+01

- 5) This condition was obsoleted on 11/10/2003. These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-

247-040(5)) and (WAC 246-247-060(5)).

*Obsolated via AIR 03-1102 to update conditions to reflect current appeal language.*

- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-040(5)) and WAC 246-247-060(5)).
- 7) The facility shall notify the department at least seven calendar days prior to any planned preoperational tests of new or modified emission units that involve emissions control, monitoring, or containment systems of the emission unit(s). The department reserves the right to witness or require preoperational tests involving the emissions control, monitoring, or containment systems of the emissions unit(s) (WAC 246-247-060(4)).
- 8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 10) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall notify the department within twenty-four hours of any shutdown, or of any transient abnormal condition lasting more than four hours or other change in facility operations which, if allowed to persist, would result in emissions of radioactive material in excess of applicable standards or license requirements (WAC 246-247-080(5)).
- 17) The facility shall file a report of closure with the department whenever operations producing emissions of radioactive material are permanently ceased at any emission unit (except temporary emission units) regulated under this chapter. The closure report shall indicate whether, despite cessation of operations, there is still a potential for radioactive air emissions and a need for an active or passive ventilation system with emission control and/or monitoring devices. If decommissioning is planned and will constitute a modification, a NOC is required, as applicable, in accordance with WAC 246-247-060. (WAC 246-247-080(6))
- 18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter.

The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

- 19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
- 21) Prior to operation of the emission unit documentation, by a professional engineer, shall be provided to WDOH demonstrating compliance with the requirements of AG-1 Sections BA, SA, HA, FC, DA, CA, and ASME/ANSI N510 leak test criteria.
- 22) All ductwork connecting the tank to the exhauster shall be pressure tested in accordance with the requirements of AG-1 Section SA.
- 23) HEPA filters shall be individually tested in-place at least annually to the requirements ASME N510 Section 10, with a minimum efficiency of 99.95%.
- 24) The emission unit shall be operational during all sluicing activities.
- 25) The emission unit hours of operation shall be tracked on a WDOH approved log and shall not exceed 2880 hours of operation.
- 26) Monthly checks shall be performed on the exhaust duct to ensure there is no deterioration of the ductwork or leakage at the connections points.
- 27) Within one year of initial use of the exhauster the emission unit monitoring system shall have the following activities performed:
  - a. Inspect pitot tube systems for leaks, at least annually.
  - b. Inspect nozzles for alignment, presence of deposits, damage to sharp-edged nozzles, or other potentially degrading factors (corrosion, physical damage, etc) at least annually.
  - c. Check transport lines and if visible deposits are presents perform cleaning, at least annually.
  - d. Checks to ensure the tightness of all fittings and connections as well as a leak test of the sample system, at least annually.
  - e. Inspect rotameters of sampling systems for presence of foreign matter at the start of each sampling period.
  - f. Check the response of stack flow rate monitoring and control system at least quarterly.
  - g. A functional/calibration check of monitoring system instrumentation shall be performed at least annually.
  - h. USDOE shall provide to WDOH for review and approval copies of the procedures used to perform the above activities.
- 28) Prior to operation documentation verifying compliance to the qualification requirements of ANSI/HPS

N13.1-1999 shall be provided to WDOH.

- 29) The curie value for Pu-239 identified in the Annual Possession Quantity also includes contributions from Pu-240.
- 30) All facilities with licensed emission units, except for radioactive materials licensees, shall submit a request to the department for renewal of their radioactive air emissions license at least sixty days prior to expiration of the license or as required by the Air Operating Permit. All renewal requests shall include a summary of the operational status of all emission units, the status of facility compliance with the standards of WAC 246-247-040, and the status of any corrective actions necessary to achieve compliance with the requirements of this chapter. Facilities with licensed emission units that also hold a radioactive materials license issued by the department shall submit this information along with their radioactive material license renewal submittal. If the department is unable to renew a radioactive air emissions license before its expiration date, the existing license, with all of its requirements and limitations, remains in force until the department either renews or revokes the license (WAC 246-247-060(9)).
- 31) All radioactive air emissions licenses issued by the department, except those issued to radioactive materials licensees, shall have an expiration date of five years from date of issuance or as specified in the Air Operating Permit. For radioactive material licensees, the requirements and limitations for the operation of emission units shall be incorporated into their radioactive materials license, and shall expire when the radioactive materials license expires (WAC 246-247-060(6)).

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

**PROJECT TITLE: 300 AREA EXCAVATION ACTIVITIES**

**Date Approved: 12/20/2002**

**Emission Unit Name: 300 AREA DIFFUSE/FUGITIVE**

**Emission Unit ID 443**

This is a MINOR, FUGITIVE, non-point source emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: **ALARACT**

ALARACT [WAC 246-247-040(4)]

BARCT [WAC 246-247-040(3)]

<u>Zone or Area:</u>	<u>Abatement Technology</u>	<u>Required # of Units</u>	<u>Additional Description/Conditions</u>
			Abatement controls as required in the following Conditions and Limitations.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

<u>Federal and State Regulatory</u>	<u>Monitoring and Testing Procedure</u>	<u>Radionuclides Requiring Measurement</u>	<u>Sampling Frequency</u>
WAC 246-247-075(3)	Appendix B, Method 114	All radionuclides which could contribute 10% of the potential EDE.	As listed in the following Conditions and Limitations.

Sampling Requirements: Existing near-facility monitoring stations.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

06/10/2002 NOC Application, DOE/RL-2002-23 Revision 0, received June 10, 2002. DOE/RL-2002-23 Revision 1 received on August 1, 2002 as a result of more information requested. Conditions and Limitations, AIR 02-1004, letter dated October 7, 2002, mailed on October 15, 2002.

11/08/2002 NOC Revision approved November 8, 2002 to change process description. Conditions and Limitations, AIR 02-1225 mailed on December 20, 2002.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 1.70E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 1.70E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).

- 3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**  
excavation in the vicinity of 300 Area structures and facilities in support of site stabilization and removing/isolating/blanking utilities; obtaining samples during 300 Area deactivation activities; and activities related to access to maintenance, replacement-in-kind, and non-radiological equipment. Access to underground piping and cable shall be gained by use of an excavator or by drilling. Manual digging methods with shovels, picks, and rakes shall also be used. Samples may be obtained by excavation or other coring or drilling methods. Backfill shall be made with the original material removed or brought in 'clean' soil.

This NOC does not incorporate specific large remediation actions or final cleanup in the context of Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Excavation activities in the 300 Area are expected to take place for at least ten years or until clean up operations are conducted under CERCLA.

- 4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**
- |           |          |          |          |
|-----------|----------|----------|----------|
| Alpha - 0 | 1.00E-06 | Beta - 0 | 4.30E-05 |
|-----------|----------|----------|----------|
- 5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- 7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 10) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).

- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).
- 17) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6)).

- 18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
- 21) Diffuse/Fugitive emissions shall be monitored using the 300 Area near-field ambient air monitors. Sample collection and analysis shall follow that of the near field monitoring program. Analytical results shall be reported in the Annual Air Emissions Report. Any change to this near-field ambient monitoring program must be approved by the department.
- 22) The following controls are approved as low as reasonably achievable control technology (ALARACT) for excavation activities in the 300 Area:

- a) Health physics technician (HPT) coverage shall be provided during all excavation activities;
  - b) Appropriate controls such as water, fixatives, covers, containment tents, or windscreens shall be applied, if needed, as determined by the Health Physics organization;
  - c) After leveling, the soil surface radiological contamination levels shall be verified less than 5,000 dpm/100 cm<sup>2</sup> beta/gamma and less than 100 dpm/100 cm<sup>2</sup> alpha. If contamination is present above these levels, soil shall be removed and containerized for disposal or covered or fixed to provide containment of the contamination;
  - d) As appropriate, before starting work on isolating utilities and piping, removable contamination in the affected area(s) shall be reduced to ALARA. Measures such as expandable foam, fixatives, or glovebags shall also be used as necessary to help reduce contamination;
  - e) If field surveys during excavation identify localized areas of contamination greater than 5,000 dpm/100 cm<sup>2</sup> beta/gamma and 100 dpm/100 cm<sup>2</sup> alpha, additional surveys shall be conducted on the perimeter of the 'hot spot' to verify the localized nature, ensuring that the overall average contamination limits are not exceeded;
  - f) Excavated soils will be stockpiled in appropriately posted area(s) adjacent to excavation locations;
  - g) Soil stockpiles that are inactive for greater than 24 hours shall require positive dust control measures be applied;
  - h) All soil excavation activities operating under this NOC must cease operations when sustained wind conditions reach or exceed 20 miles per hour.
- 23) The radionuclides of concern are strontium-90 (representing beta/gamma contamination during excavation, and uranium-234 (representing alpha contamination). If any other radionuclides are suspected or verified through soil analysis the department must be notified.
  - 24) The periodic confirmatory measurements for 300 Area excavation activities shall consist of radiological surveys (smear samples). To confirm that the actual emissions remain below the estimated emissions the surveys shall be performed to demonstrate that contamination levels are below 5,000 dpm/100 cm<sup>2</sup> beta/gamma and 100 dpm/100 cm<sup>2</sup> alpha.
  - 25) When a Portable/Temporary Radioactive Air Emission Unit (PTRAEU) is used during 300 excavation activities, the conditions, controls, monitoring requirements and limitations of the PTRAEU NOC, latest approved version, shall be required.
  - 26) When a HEPA Filtered Vacuum Radioactive Air Emission Unit (HEPA VAC) is used during 300 excavation activities, the conditions, controls, monitoring requirements and limitations of the HEPA VAC NOC, latest approved version, shall be required.
  - 27) When the sitewide Guzzler is used during 300 excavation activities, the conditions, controls, monitoring requirements and limitations of the sitewide Guzzler NOC, latest approved version, shall be required.



Approval Number: AIR 02-1255

NOC ID: 548

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

PROJECT TITLE: 244-CR VAULT ISOLATION AND INTERIM STABILIZATION

Date Approved: 31-Dec-02

Emission Unit Name: GUZZLER

Emission Unit ID 476

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: ALARACT

ALARACT [WAC 246-247-040(4)]

BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	Collection Tank and Plate Separator	1	
	Cyclone Separator	1	Baghouse with 72 bags each.
	Micro-strainer Device	1	
	HEPA	3	Three in-place tested HEPA filters in parallel.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075(3)	Appendix D, Method 114(3)	All radionuclides which could contribute greater than 10% of the potential-to-emit TEDE to the MEL, greater than 0.1 mrem/yr potential-to-emit TEDE to the MEL, and greater than 25% of the TEDE to the MEL, after controls.	When the HEPA filters are replaced and annually screening the HEPA filtration system.

Sampling Requirements: Radiation surveys and to include but not limited to NDA testing of the HEPA filters and screening the HEPA filtration system using gamma spectroscopy.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

10/24/2002 Original NOC approved on December 31, 2002 via AIR 02-1255 and replaces NOC ID 45.

CONDITIONS AND LIMITATIONS

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

Printed on 08-Jan-03

1)

- 2) The total abated emission limit for this Notice of Construction is limited to  $5.10\text{E-}02$  mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to  $5.82\text{E+}01$  mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).
- 3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**  
activities performed at the 244-CR Vault Facility, ER-153 and/or 244-A Lift Station. These activities include:

**Work Area Preparation:**

- Miscellaneous work including equipment delivery, movement, set up and maintenance in the general work area around the 244-CR Vault Facility.
- Construction and take down of open top containment tents (bullpens) over the facility vault area.
- Installation of Portable/Temporary Radioactive Air Emission Unit(s) (PTRAEUs).
- Installation of portable 1,000 cubic feet per minute (cfm) exhausters.
- Removal and/or installation of vault foam covering.
- Application of fixative at pit interior.
- Temporary power installation.

**Facility/Interim Stabilization Work:**

- Operation of PTRAEU for bullpen ventilation.
- Removal and/or installation of pit covers.
- Inspection of pits, vaults, and tanks.
- Removal and disposition of excess equipment and waste in pits, risers, and tanks.
- Decontamination activities.
- Measurement of liquid level and sludge levels in tanks and sumps.
- Sampling activities in pits, vaults, and tanks including chemical addition and/or waste sampling to determine Double Shell Tank waste acceptance.

**Facility Equipment Activities:**

- Installation, disconnection, repair, replacement, and/or leak testing, of new and existing facility equipment (valves, jumpers, pumps, leak detectors, or other instrumentation/equipment).

- Modifications, maintenance, and/or isolation and sealing of existing risers, pits, vaults and incoming and/or outgoing piping (drain and transfer lines) from 244-CR Vault or connected facility.

**Excavation:**

- Installation of permanent power to 244-CR Vault Facility.
- Installation/Operation of Passive Breather Filter Assembly.

**Waste Transfer and Support Activities:**

- Operation of 1,000 cfm portable exhauster at 244-CR Vault.
- New waste transfer system, waste staging/consolidation.

**Miscellaneous activities shall include:**

- Construction and take down of open top containment tents over the facility vault area.
- Open top containment tents (bullpens) shall be constructed over the facility pit area to prevent potential airborne contamination from the effected work area to the environment. Two bullpens shall be erected around two instrumentation pits at the 244-CR Vault. Upon completion of the first pit's work, the bullpens shall be relocated to the other two pits and their work will be completed.
- Installation of Portable/Temporary Radioactive Air Emission Unit(s) (PTRAEUs)
- A Portable/Temporary Radioactive Air Emission Unit (2,000 cfm) or units (1,000 cfm each) shall be installed to ventilate the bullpens during activities that require work in the pits, cells and tank vault area prior to performing waste transfer activities. One thousand cfm PTRAEUs, if used, shall be directly connected to individual bullpens, while a 2,000 PTRAEU if used, shall be connected to two bullpens. Movement and installation of the PTRAEU can be performed to facilitate ventilation for the four vaults of the 244-CR Vault Facility. The PTRAEU shall operate intermittently (during work activities) and will be operated in accordance with the latest WDOH approval, AIR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).

A portable 1,000 cfm exhauster shall be installed to ventilate the 244-CR Facility vaults and tanks during waste transfer activities. This exhauster shall operate intermittently to support waste transfer and support activities and shall monitor air emissions. The exhauster shall be piped into the existing 244-CR facility ventilation system upstream of the existing (non-operating) exhauster, 296-C-05 and HEPA filters. The existing 244-CR Facility exhaust system shall be isolated and not used. Tie in of the 1,000 cfm exhauster to the existing exhaust system shall be in accordance with ALARACT 16, Tank Farm ALARACT Demonstration for Work on Potentially Contaminated Ventilation System Components. After the waste transfer is completed, the exhauster shall be removed in accordance to the requirements of ALARACT 16.

A foam covering has been placed over the 244-CR Vault area to prevent intrusion of precipitation and snowmelt. In order to gain access to the pit cover (metal) plates or concrete cover blocks, sections of the foam shall be removed, packaged, transported and disposed of. ALARACT 4, Tank Farm ALARACT Demonstration for Packaging and Transportation of Waste shall be used to properly disposition the

removed foamed covering. Radiation control technicians (RCT) shall monitor the affected work area while the foam covering is being removed. The foam covering shall be replaced after work is complete, as part of intrusion prevention measures completed by the project following waste transfer activities.

A fixative shall be applied either with the pit covers on. The fixatives shall be applied to pit surfaces through a port in the pit cover using a 'whirly' or by fogging. A hand held sprayer is used to apply fixatives to local areas within the pit when the pit cover is off.

Temporary power installation will be limited to meet the needs to support the work described in this NOC. Temporary installations can be removed when no longer needed.

#### Operation of PTRAEU for Bullpen Ventilation.

Ventilation of the bullpens during pre waste transfer tank activities and prior to the installation of the 1,000 cfm portable exhaustor shall be accomplished with the use of PTRAEU(s). The PTRAEU(s) shall be operated in accordance with the latest WDOH approval, AIR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).

Concrete cover key blocks are removed first, and only blocks necessary to perform intended work are removed. Consideration is given to sliding blocks to minimize the number of blocks to be removed. As discussed in the following, pit covers are decontaminated and/or covered with fixative before removal. Pit Covers are raised a minimum distance to safely allow a radiation protection technician to perform a dose rate and contamination survey. Pit covers are wrapped in plastic and set down in a specially prepared lay-down area. On completion of activities, the plastic wrap is removed from the pit covers and the pit covers are re-installed in their original position and orientation. Post-job surveys are performed.

Inspections, such as visual, video, or nondestructive inspections, shall be performed with pit covers in place (for pit with access ports) or removed. The pit cover design, historical inspection information, and ALARA information shall be used to determine whether the inspection shall be performed manually (with pit cover removed) or remotely with a camera and the pit covers in place.

Excess equipment and debris currently located in the 244-CR vault pits, and in-tank equipment shall be removed to accommodate new waste transfer equipment and piping. Excess equipment shall be replaced with replacement in kind equipment, as necessary.

To facilitate the removal and disposition of these items, size reduction and decontamination activities shall be utilized. Size reduction activities shall include cutting up unusable equipment (usually jumpers/blanks) remotely, using hydraulic shears or low revolutions per minute portable band saws. All size reduction activities shall be performed in accordance with ALARACT Demonstration 15, TWRS ALARACT Demonstration for Size Reduction of Waste Equipment for Disposal.

Disposition of excess equipment and waste shall be performed in accordance with ALARACT Demonstration 4, TWRS ALARACT Demonstration for packaging and transportation of waste.

Removable contamination in the accessible portions of the pit is reduced to less than 100,000 disintegrations per minute/100 square centimeters beta/gamma and 2,000 disintegrations per minute/100 square centimeters alpha by washing, or an approved fixative is applied to pit surfaces. Initial washing with a low pressure (125 pounds per square inch gauge), or high pressure (3,000 pounds per square inch gauge) 'whirly' is accomplished through a port in the pit cover blocks. Additional decontamination

activities (with the cover block off) include the use of chemicals, peel and strip paints, water, or manual scrub brushes.

After a section of equipment has been washed it shall be pulled into plastic sleeving and sealed by horse tailing and taping.

Liquid and sludge levels are determined using zip cords or other appropriate means that shall not disturb the waste more than zip cords.

Sampling activities shall be performed in the tank and sump area of 244-CR Vault by way of risers in the riser pit in accordance with ALARACT 7, "Tank Farm ALARACT Demonstration For Tank Waste Grab Sampling." Radiological controls for riser preparation/opening listed in ALARACT 1, "Tank Farm ALARACT Demonstration for Riser Preparation/opening," shall be followed.

The waste transfer processes shall transfer waste from tanks CR-011, CR-001, CR-002 and CR-003 and sumps within 244-CR Vault Facility to a staging tank within the 244-CR Facility. The transfer system to consolidate the waste from individual tanks consists of above ground piping of a hose in hose with leak detection at each tank's pit being utilized to support the transfer line. Mixing and dilution of the waste may take place at the receiving tank or within the transfer lines directly. The transfer system may include equipment pump skids and shall include appropriate connections to the transfer lines to accommodate chemical and water addition to the 244-CR Facility tanks and mixing prior to transfer to the designated Double Shell Tank (DST).

Before entry into a pit, an evaluation is made by engineering and/or operations personnel to determine the transfer routing configuration after pit work is complete. On removal of cover blocks, a visual inspection of pit contents is made to verify present configuration.

Tools such as impact wrenches, T-bars, and pike poles are used to repair or replace pit equipment. All equipment coming out of the pit is wrapped in plastic or otherwise contained or decontaminated for reuse or disposal. Removable contamination on the outer-most container shall not exceed 1,000 disintegrations per minute/100 square centimeters beta/gamma and 20 disintegrations per minute/100 square centimeters alpha before removal from the bullpen. Disposition of non reusable equipment waste shall be performed in accordance with ALARACT Demonstration 4, TWRS ALARACT Demonstration for packaging and transportation of waste.

Jumper work shall be preceded by flushing the appropriate transfer lines with water. Jumper work is accomplished remotely, using a crane to maneuver heavy equipment and parts. Installation, disconnection, and/or changing jumpers/blanks are accomplished by slowly loosening the jumper/blank at the connector head. The required jumper/blank is positioned and tightened to the new connector heads. If the process line or equipment being worked on is connected physically to other unnecessary transfer lines, or if the line is to be left unused, a cap, blank, or equivalent is installed on all open nozzles not connected to jumpers.

Leak testing of newly installed jumpers/blanks shall be performed with pressurized water before initiating waste transfers. Occasionally, a jumper leak test is performed during the initial stages of the transfer. In either case, cover blocks shall be in place before leak testing is performed.

Cutting up unusable pit equipment (usually jumpers/blanks) is accomplished remotely using hydraulic shears or low revolutions per minute portable band saws. Cutting activities shall be performed in the bullpen or in glovebags. The goal shall be to maintain a contamination level equal to or less than 1,000

dpm/100 cm<sup>2</sup> beta gamma and 20 dpm/100 cm<sup>2</sup> alpha, during cutting activities, but may not always be attainable. RCT coverage shall be provided. Should contamination levels exceed 1,000-dpm/100 cm<sup>2</sup> additional sleeving, or use of a glove bag shall be used and/or decontamination activities performed to lower the levels in accordance with ALARA. Welding (if required) shall commence once removable contamination levels in the cut and weld area are reduced to ALARA. Size reduction (cutting) activities shall be performed in accordance with ALARACT Demonstration 15, TWRS ALARACT Demonstration for Size Reduction of Waste Equipment for Disposal. To ensure that water intrusions or potential residual waste in piping are eliminated from the facility, existing piping and transfer lines to and from the 244-CR Vault facility shall be blanked, grouted, or sealed. The isolation includes activities such as installing plugs, caps, blind flanges, or grouting. Isolations may occur at the 244-CR riser pit area or at the other end of the pipe in a diversion or valve box, at the ER153 or the 244A Lift Station.

Modifications to existing in-route pits, vaults and piping shall be required to establish the waste transfer route or to ensure the integrity of the system prior to waste transfer. These modifications can include but are not limited to, removal of existing parts and replacement with like parts, installation of new jumpers, or blanking off of equipment. When possible existing blanks shall be utilized. Pipe cutting shall be minimized in compliance with ALARA. If it is determined that the installation of a new above ground transfer line would be the best engineering method to establish a waste transfer route, a temporary transfer route shall be established following existing design and installation procedures. This temporary route will be either above ground or in a shallow trench. If a trench is required excavation shall be performed as described under that activity in this NOC.

Pit drains are checked using water from a tanker truck or another source. Water at a flow rate of approximately 20 gallons per minute is added to a pit drain line and subsequently monitored to verify the pit drains are free of restrictions. At times it might be necessary to pump the DCRT that receives the water after the water passes through the pit drain if the volume of test water approaches the capacity of the DCRT.

Either flushing with water and/or using a retrieval tool to remove debris from the drain are used to clear plugged drains. Water supply valves are opened slowly to minimize splashing. Pressures above 50 pounds per square inch gauge require approval from the engineering organization. Cover blocks shall remain in place and work is accomplished through a penetration in the cover block.

The waste transfer operations involve the pumping of liquid waste that contains dissolved solids. These solids can precipitate out of solution anywhere in the transfer path and cause blockage. If blockage is detected in the system, flushing the lines with hot water is necessary. The hot water is introduced to the system to be flushed through a pressure manifold by piping connected directly to a jumper or nozzle. These operations shall be performed with the pit covers on.

To ensure that water intrusions are eliminated from the facility, a foam covering will be placed over the 244-CR Vault area after completion of isolation activities.

Other techniques to free blockages could include pressurization, temporary jumpers, and hydraulic scouring. All piping connections are designed to be leak tight and the pit cover block shall be installed before pressurization. If pressurization beyond that obtained from the tank farms water system or supply truck (i.e., approximately 150 pounds per square inch gauge) is necessary to remove blockage, an engineering evaluation shall be performed to determine the maximum allowable pressure for operation.

Excavation:

Excavation may be required to support installation of ventilation, electrical support and waste transfer equipment. Modifications to existing in route pits, vaults and piping and/or to support installation of new waste transfer lines from the 244-CR Facility to the identified DST may require excavation. Soil excavation activities will be performed in accordance with ALARACT Demonstration 5, TWRS ALARACT Demonstration for Soil Excavation (Using Hand Tools), and will follow the radiological controls specified in that ALARACT.

Any Guzzler excavations in contamination areas will be performed in accordance with the December 18, 1998, WDOH approved Site Wide Guzzler NOC (Air 98-1215), or the most current NOC approved for Guzzler use. Excavation of contaminated soils using heavy equipment shall follow the requirement of Site Wide Guzzler NOC.

Soil excavation outside the tank farm fence also may be performed with heavy equipment.

Soil will be excavated around the 244-CR vault facility to install new piping, equipment slabs, and new waste transfer system support equipment. It is expected that about 1,000 cubic yards may be excavated, with about 600 cubic yards from inside the tank farm. Backfill shall be from the original removed soil or non-contaminated controlled density fill (sand, water and a small amount of cement).

Current power within the 244-CR Vault Facility is limited. To provide power for new equipment installed under the project, the existing power distribution system shall be upgraded. Upgrades shall involve modification to the existing Motor Control Center (MCC), installation of equipment control panels, and installation of new conduits.

A compliant passive breather filter shall be installed to ventilate the 244-CR Facility vaults and tanks once waste transfer activities are completed. The passive breather filters shall be installed at two locations in the 244-CR facility. A 1,000 cfm HEPA filter shall be installed at the air inlet assembly (previously attached to the evaporative cooler) and a 160 cfm HEPA filter shall be installed upstream of the existing HEPA filter pit. Butterfly valves in the ventilation system just downstream of where the filters shall be installed can be shut to prevent any emission from the facility during filter installation. Installation of the filters shall be performed in accordance with ALARACT Demonstration 16, TWRS ALARACT Demonstration for Work on Potentially Contaminated Ventilation System Components.

During waste transfer and support activities the tank and vault air space shall be actively ventilated by a temporary ventilation system. The temporary ventilation system shall consist of a portable exhaustor that shall be equipped with compliant monitoring and sampling equipment. The purpose of the exhaustor is to ensure potential airborne contamination from the pits, cells, or process tanks, is not being released to the environment. Operation of the 1,000 cfm portable exhaustor is considered an emissions control.

New waste transfer system, waste staging/consolidation.

The planned transfer system can utilize some existing equipment along with installation of new piping and equipment at 244-CR, ER-153 and/or 244-A Lift Station. Maintenance of the transfer system may be required during the waste staging/consolidation. Equipment, which may require on going maintenance includes but is not limited to leak detection and pump system equipment. The waste can be staged/consolidated in one or two of the 244-CR Facility tanks (CR-001, CR-002, CR-003 and CR-011) prior to transfer to a DST.

The following controls are used for the pit activities:

#### General Controls:

1. Pre-job and post-job radiation surveys are performed by radiation protection technicians. Radiation work permits specify permissible occupational radiological limits during activities. Radiation control technicians' survey and release equipment, inspect and approve required containment, and provide radiological surveys to verify compliance to radiation work permit limits.
2. Pit work is shut down (or not initiated) when sustained wind speeds exceed 25 miles per hour as measured in the field and/or reported by the Hanford Meteorological Station.
3. Fixatives shall be applied inside the pit (with cover blocks on or off) or accessible portions of the pit decontaminated to less than 100,000 disintegrations per minute/100 square centimeters beta-gamma and 2,000 disintegrations per minute/100 square centimeters alpha.
4. When cover blocks are removed, a fall protection handrail is installed. This handrail is draped in plastic forming a contamination barrier. The plastic extends to the top of the pit and is taped or sealed at the top of the pit. Decontamination of the containment barrier is conducted as required by the job specific radiation work permit.
5. Radiation control technicians monitor the affected work area when the vault foam covering is removed, when jumpers and equipment are being removed from risers and nozzles, and when risers are entered for sampling of tanks and sumps. Jumpers removed from the pit are drained of free liquid and decontaminated or contained before removal. The outer-most container shall not exceed 1,000 disintegrations per minute/100 square centimeters beta/gamma and 20 disintegrations per minute/100 square centimeters alpha. If these limits are exceeded, surfaces shall be decontaminated. Disposition of non reusable equipment waste shall be performed in accordance with ALARACT Demonstration 4, TWRS ALARACT Demonstration for packaging and transportation of waste.
6. A bullpen designed to minimize the top opening shall be used. Pit covers or cover blocks will be removed as necessary. If the bullpen is to be left unattended at any time, a temporary cover is placed over the pit or the pit covers or cover blocks are reinstalled. Two tents shall be erected over two pits. Upon completion of the work in the first two 244-CR Facility instrumentation pits, the tents will be relocated to the other 244-CR facility instrumentation pits.
7. PTRAEU(s) shall actively ventilate the bullpens during activities that require work in the pits (after removal of the cover blocks) to control radiological releases. The PTRAEU(s) shall operate intermittently and shall be operated in accordance with the latest revision to the WDOH approved, Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).
8. A compliant exhaust skid shall ventilate the process cells and tanks during waste transfer activities. The exhaust skid shall maintain a negative pressure under the cover blocks and prevent contaminants from reaching the environment. The exhaust skid shall be connected to the existing exhaust ductwork with rigid or flexible ductwork.
9. The 1,000 cfm exhaust skid shall be equipped with a two-stage HEPA filter, which meets the requirements of ASME AG-1, Section FC and shall be tested annually to requirements of ASME N510. The HEPA filters shall have an efficiency of 99.95 percent for 0.3-micron median diameter. Each filter housing shall meet the applicable sections of ASME N509 and the test requirement of ASME N510. The exhaust stack houses a Generic Effluent Monitoring System (GEMS) that contains an air velocity



probe and the air sampling probe.

10. The breather filter shall consist of a housing that contains a HEPA filter, an outlet screen, and a small seal loop. Air flowing to and from the 244-CR Facility shall pass horizontally through the filter and vertically through the downward-facing exit weather hood. Seal loops, installed in the exhaust lines, are designed as a safety feature to prevent unlikely accident in which an over pressurization occurs when the HEPA filter is isolated for occasional (infrequent) maintenance.

Specific Controls include:

- Installation of portable 1,000 cfm exhauster shall use ALARACT 16.
- Removal and/or installation of vault foam covering - ALARACT 4.
- Application of fixative at pit interior - see General Controls.
- Temporary power installation - ALARA.
- Operation of PTRAEU for bullpen ventilation - Latest WDOH approval, AIR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).
- Removal and/or installation of pit covers - General Controls.
- Inspection of pits, vaults, and tanks - General Controls.
- Removal and disposition of excess equipment and waste in pits, risers, and tanks - ALARACT 15, and ALARACT 4.
- Decontamination activities - General Controls.
- Measurement of liquid level and sludge levels in tanks and sumps - General Controls.
- Sampling activities in pits, vaults, and tanks including chemical addition and/or waste sampling to determine Double Shell Tank waste acceptance - ALARACT 7 and ALARACT 1.
- Facility Equipment Activities: installation, disconnection, repair, replacement, and/or leak testing, of new and existing facility equipment (valves, jumpers, pumps, leak detectors, or other instrumentation/equipment) - ALARACT 4, and ALARACT 15.
- Modifications, maintenance, and/or isolation and sealing of existing in route pits, vaults and piping (drain and transfer lines) to support and/or installation of new transfer lines - General Controls.
- Excavation - ALARACT 5, and/or WDOH approved Site Wide Guzzler NOC (Air 98-1215), or the most current NOC approved for Guzzler use.
- Installation of permanent power to 244-CR Vault Facility - ALARA.
- Installation of passive breather filter assembly - ALARACT 16.
- Operation of a portable exhauster at 244-CR vault for ventilation - ALARA.

-New waste transfer system, waste staging/consolidation - General Controls.

**4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Am - 241	6.31E-03	Sr - 90	1.26E-02
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- 5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- 7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 10) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).
- 17) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or

monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

- 18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
- 21) Diffuse/Fugitive emissions shall be monitored using the 200 Area near-field ambient air monitors. Sample collection and analysis shall follow that of the near field monitoring program. Analytical results shall be reported in the Annual Air Emissions Report. Any change to this near-field ambient monitoring program must be approved by the department.

Approval Number: AIR 02-1255

NOC ID: 548

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

PROJECT TITLE: 244-CR VAULT ISOLATION AND INTERIM STABILIZATION

Date Approved: 31-Dec-02

Emission Unit Name: 200 AREA DIFFUSE/FUGITIVE

Emission Unit ID 486

This is a MAJOR, FUGITIVE, non-point source emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]  
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
			Abatement controls as required in the following Conditions and Limitations.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075(3)	Appendix B, Method 114	All radionuclides which could contribute 10% of the potential TEDE.	As listed in the following Conditions and Limitations.

Sampling Requirements: Existing near-facility monitoring stations.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

10/24/2002 Original NOC approved on December 31, 2002 via AIR 02-1255 and replaces NOC ID 45.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to  $5.10\text{E-}02$  mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to  $5.82\text{E-}01$  mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).
- 3) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:  
activities performed at the 244-CR Vault Facility, ER-153 and/or 244-A Lift Station. These activities include:

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#### Work Area Preparation:

- Miscellaneous work including equipment delivery, movement, set up and maintenance in the general work area around the 244-CR Vault Facility.
- Construction and take down of open top containment tents (bullpens) over the facility vault area.
- Installation of Portable/Temporary Radioactive Air Emission Unit(s) (PTRAEUs).
- Installation of portable 1,000 cubic feet per minute (cfm) exhausters.
- Removal and/or installation of vault foam covering.
- Application of fixative at pit interior.
- Temporary power installation.

#### Facility/Interim Stabilization Work:

- Operation of PTRAEU for bullpen ventilation.
- Removal and/or installation of pit covers.
- Inspection of pits, vaults, and tanks.
- Removal and disposition of excess equipment and waste in pits, risers, and tanks.
- Decontamination activities.
- Measurement of liquid level and sludge levels in tanks and sumps.
- Sampling activities in pits, vaults, and tanks including chemical addition and/or waste sampling to determine Double Shell Tank waste acceptance.

#### Facility Equipment Activities:

- Installation, disconnection, repair, replacement, and/or leak testing, of new and existing facility equipment (valves, jumpers, pumps, leak detectors, or other instrumentation/equipment).
- Modifications, maintenance, and/or isolation and sealing of existing risers, pits, vaults and incoming and/or outgoing piping (drain and transfer lines) from 244-CR Vault or connected facility.

#### Excavation:

- Installation of permanent power to 244-CR Vault Facility.
- Installation/Operation of Passive Breather Filter Assembly.

#### Waste Transfer and Support Activities:

- Operation of 1,000 cfm portable exhausters at 244-CR Vault.
- New waste transfer system, waste staging/consolidation.

Miscellaneous activities shall include:

- Construction and take down of open top contaminant tents over the facility vault area.
- Open top containment tents (bullpens) shall be constructed over the facility pit area to prevent potential airborne contamination from the effected work area to the environment. Two bullpens shall be erected around two instrumentation pits at the 244-CR Vault. Upon completion of the first pit's work, the bullpens shall be relocated to the other two pits and their work will be completed.
- Installation of Portable/Temporary Radioactive Air Emission Unit(s) (PTRAEUs)
  - A Portable/Temporary Radioactive Air Emission Unit (2,000 cfm) or units (1,000 cfm each) shall be installed to ventilate the bullpens during activities that require work in the pits, cells and tank vault area prior to performing waste transfer activities. One thousand cfm PTRAEUs, if used, shall be directly connected to individual bullpens, while a 2,000 PTRAEU if used, shall be connected to two bullpens. Movement and installation of the PTRAEU can be performed to facilitate ventilation for the four vaults of the 244-CR Vault Facility. The PTRAEU shall operate intermittently (during work activities) and will be operated in accordance with the latest WDOH approval, ATR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).

A portable 1,000 cfm exhauster shall be installed to ventilate the 244-CR Facility vaults and tanks during waste transfer activities. This exhauster shall operate intermittently to support waste transfer and support activities and shall monitor air emissions. The exhauster shall be piped into the existing 244-CR facility ventilation system upstream of the existing (non-operating) exhauster, 296-C-05 and HEPA filters. The existing 244-CR Facility exhaust system shall be isolated and not used. Tie in of the 1,000 cfm exhauster to the existing exhaust system shall be in accordance with ALARACT 16, Tank Farm ALARACT Demonstration for Work on Potentially Contaminated Ventilation System Components. After the waste transfer is completed, the exhauster shall be removed in accordance to the requirements of ALARACT 16.

A foam covering has been placed over the 244-CR Vault area to prevent intrusion of precipitation and snowmelt. In order to gain access to the pit cover (metal) plates or concrete cover blocks, sections of the foam shall be removed, packaged, transported and disposed of. ALARACT 4, Tank Farm ALARACT Demonstration for Packaging and Transportation of Waste shall be used to properly disposition the removed foamed covering. Radiation control technicians (RCT) shall monitor the affected work area while the foam covering is being removed. The foam covering shall be replaced after work is complete, as part of intrusion prevention measures completed by the project following waste transfer activities.

A fixative shall be applied either with the pit covers on. The fixatives shall be applied to pit surfaces through a port in the pit cover using a 'whirly' or by fogging. A hand held sprayer is used to apply fixatives to local areas within the pit when the pit cover is off.

Temporary power installation will be limited to meet the needs to support the work described in this NOC. Temporary installations can be removed when no longer needed.

#### Operation of PTRAEU for Bullpen Ventilation.

Ventilation of the bullpens during pre waste transfer tank activities and prior to the installation of the 1,000 cfm portable exhauster shall be accomplished with the use of PTRAEU(s). The PTRAEU(s) shall be operated in accordance with the latest WDOH approval, AJR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).

Concrete cover key blocks are removed first, and only blocks necessary to perform intended work are removed. Consideration is given to sliding blocks to minimize the number of blocks to be removed. As discussed in the following, pit covers are decontaminated and/or covered with fixative before removal. Pit Covers are raised a minimum distance to safely allow a radiation protection technician to perform a dose rate and contamination survey. Pit covers are wrapped in plastic and set down in a specially prepared lay-down area. On completion of activities, the plastic wrap is removed from the pit covers and the pit covers are re-installed in their original position and orientation. Post-job surveys are performed.

Inspections, such as visual, video, or nondestructive inspections, shall be performed with pit covers in place (for pit with access ports) or removed. The pit cover design, historical inspection information, and ALARA information shall be used to determine whether the inspection shall be performed manually (with pit cover removed) or remotely with a camera and the pit covers in place.

Excess equipment and debris currently located in the 244-CR vault pits, and in-tank equipment shall be removed to accommodate new waste transfer equipment and piping. Excess equipment shall be replaced with replacement in kind equipment, as necessary.

To facilitate the removal and disposition of these items, size reduction and decontamination activities shall be utilized. Size reduction activities shall include cutting up unusable equipment (usually jumpers/blanks) remotely, using hydraulic shears or low revolutions per minute portable band saws. All size reduction activities shall be performed in accordance with ALARACT Demonstration 15, TWRS ALARACT Demonstration for Size Reduction of Waste Equipment for Disposal.

Disposition of excess equipment and waste shall be performed in accordance with ALARACT Demonstration 4, TWRS ALARACT Demonstration for packaging and transportation of waste.

Removable contamination in the accessible portions of the pit is reduced to less than 100,000 disintegrations per minute/100 square centimeters beta/gamma and 2,000 disintegrations per minute/100 square centimeters alpha by washing, or an approved fixative is applied to pit surfaces. Initial washing with a low pressure (125 pounds per square inch gauge), or high pressure (3,000 pounds per square inch gauge) 'whirly' is accomplished through a port in the pit cover blocks. Additional decontamination activities (with the cover block off) include the use of chemicals, peel and strip paints, water, or manual scrub brushes.

After a section of equipment has been washed it shall be pulled into plastic sleeving and sealed by horse tailing and taping.

Liquid and sludge levels are determined using zip cords or other appropriate means that shall not disturb the waste more than zip cords.

Sampling activities shall be performed in the tank and sump area of 244-CR Vault by way of risers in the riser pit in accordance with ALARACT 7, "Tank Farm ALARACT Demonstration For Tank Waste

Grab Sampling." Radiological controls for riser preparation/opening listed in ALARACT 1, "Tank Farm ALARACT Demonstration for Riser Preparation/opening," shall be followed.

The waste transfer processes shall transfer waste from tanks CR-011, CR-001, CR-002 and CR-003 and sumps within 244-CR Vault Facility to a staging tank within the 244-CR Facility. The transfer system to consolidate the waste from individual tanks consists of above ground piping of a hose in hose with leak detection at each tank's pit being utilized to support the transfer line. Mixing and dilution of the waste may take place at the receiving tank or within the transfer lines directly. The transfer system may include equipment pump skids and shall include appropriate connections to the transfer lines to accommodate chemical and water addition to the 244-CR Facility tanks and mixing prior to transfer to the designated Double Shell Tank (DST).

Before entry into a pit, an evaluation is made by engineering and/or operations personnel to determine the transfer routing configuration after pit work is complete. On removal of cover blocks, a visual inspection of pit contents is made to verify present configuration.

Tools such as impact wrenches, T-bars, and pike poles are used to repair or replace pit equipment. All equipment coming out of the pit is wrapped in plastic or otherwise contained or decontaminated for reuse or disposal. Removable contamination on the outer-most container shall not exceed 1,000 disintegrations per minute/100 square centimeters beta/gamma and 20 disintegrations per minute/100 square centimeters alpha before removal from the bullpen. Disposition of non reusable equipment waste shall be performed in accordance with ALARACT Demonstration 4, TWRS ALARACT Demonstration for packaging and transportation of waste.

Jumper work shall be preceded by flushing the appropriate transfer lines with water. Jumper work is accomplished remotely, using a crane to maneuver heavy equipment and parts. Installation, disconnection, and/or changing jumpers/blanks are accomplished by slowly loosening the jumper/blank at the connector head. The required jumper/blank is positioned and tightened to the new connector heads. If the process line or equipment being worked on is connected physically to other unnecessary transfer lines, or if the line is to be left unused, a cap, blank, or equivalent is installed on all open nozzles not connected to jumpers.

Leak testing of newly installed jumpers/blanks shall be performed with pressurized water before initiating waste transfers. Occasionally, a jumper leak test is performed during the initial stages of the transfer. In either case, cover blocks shall be in place before leak testing is performed.

Cutting up unusable pit equipment (usually jumpers/blanks) is accomplished remotely using hydraulic shears or low revolutions per minute portable band saws. Cutting activities shall be performed in the bullpen or in glovebags. The goal shall be to maintain a contamination level equal to or less than 1,000 dpm/100 cm<sup>2</sup> beta gamma and 20 dpm/100 cm<sup>2</sup> alpha, during cutting activities, but may not always be attainable. RCT coverage shall be provided. Should contamination levels exceed 1,000-dpm/100 cm<sup>2</sup> additional sleeving, or use of a glove bag shall be used and/or decontamination activities performed to lower the levels in accordance with ALARA. Welding (if required) shall commence once removable contamination levels in the cut and weld area are reduced to ALARA. Size reduction (cutting) activities shall be performed in accordance with ALARACT Demonstration 15, TWRS ALARACT Demonstration for Size Reduction of Waste Equipment for Disposal. To ensure that water intrusions or potential residual waste in piping are eliminated from the facility, existing piping and transfer lines to and from the 244-CR Vault facility shall be blanked, grouted, or sealed. The isolation includes activities such as installing plugs, caps, blind flanges, or grouting. Isolations may occur at the 244-CR riser pit area or at the other end of the pipe in a diversion or valve box, at the ER153 or the 244A Lift Station.



Modifications to existing in-route pits, vaults and piping shall be required to establish the waste transfer route or to ensure the integrity of the system prior to waste transfer. These modifications can include but are not limited to, removal of existing parts and replacement with like parts, installation of new jumpers, or blanking off of equipment. When possible existing blanks shall be utilized. Pipe cutting shall be minimized in compliance with ALARA. If it is determined that the installation of a new above ground transfer line would be the best engineering method to establish a waste transfer route, a temporary transfer route shall be established following existing design and installation procedures. This temporary route will be either above ground or in a shallow trench. If a trench is required excavation shall be performed as described under that activity in this NOC.

Pit drains are checked using water from a tanker truck or another source. Water at a flow rate of approximately 20 gallons per minute is added to a pit drain line and subsequently monitored to verify the pit drains are free of restrictions. At times it might be necessary to pump the DCRT that receives the water after the water passes through the pit drain if the volume of test water approaches the capacity of the DCRT.

Either flushing with water and/or using a retrieval tool to remove debris from the drain are used to clear plugged drains. Water supply valves are opened slowly to minimize splashing. Pressures above 50 pounds per square inch gauge require approval from the engineering organization. Cover blocks shall remain in place and work is accomplished through a penetration in the cover block.

The waste transfer operations involve the pumping of liquid waste that contains dissolved solids. These solids can precipitate out of solution anywhere in the transfer path and cause blockage. If blockage is detected in the system, flushing the lines with hot water is necessary. The hot water is introduced to the system to be flushed through a pressure manifold by piping connected directly to a jumper or nozzle. These operations shall be performed with the pit covers on.

To ensure that water intrusions are eliminated from the facility, a foam covering will be placed over the 244-CR Vault area after completion of isolation activities.

Other techniques to free blockages could include pressurization, temporary jumpers, and hydraulic scouring. All piping connections are designed to be leak tight and the pit cover block shall be installed before pressurization. If pressurization beyond that obtained from the tank farms water system or supply truck (i.e., approximately 150 pounds per square inch gauge) is necessary to remove blockage, an engineering evaluation shall be performed to determine the maximum allowable pressure for operation.

#### Excavation:

Excavation may be required to support installation of ventilation, electrical support and waste transfer equipment. Modifications to existing in route pits, vaults and piping and/or to support installation of new waste transfer lines from the 244-CR Facility to the identified DST may require excavation. Soil excavation activities will be performed in accordance with ALARACT Demonstration 5, TWRS ALARACT Demonstration for Soil Excavation (Using Hand Tools), and will follow the radiological controls specified in that ALARACT.

Any Guzzler excavations in contamination areas will be performed in accordance with the December 18, 1998, WDOH approved Site Wide Guzzler NOC (Air 98-1215), or the most current NOC approved for Guzzler use. Excavation of contaminated soils using heavy equipment shall follow the requirement of Site Wide Guzzler NOC.

Soil excavation outside the tank farm fence also may be performed with heavy equipment.

Soil will be excavated around the 244-CR vault facility to install new piping, equipment slabs, and new waste transfer system support equipment. It is expected that about 1,000 cubic yards may be excavated, with about 600 cubic yards from inside the tank farm. Backfill shall be from the original removed soil or non-contaminated controlled density fill (sand, water and a small amount of cement).

Current power within the 244-CR Vault Facility is limited. To provide power for new equipment installed under the project, the existing power distribution system shall be upgraded. Upgrades shall involve modification to the existing Motor Control Center (MCC), installation of equipment control panels, and installation of new conduits.

A compliant passive breather filter shall be installed to ventilate the 244-CR Facility vaults and tanks once waste transfer activities are completed. The passive breather filters shall be installed at two locations in the 244-CR facility. A 1,000 cfm HEPA filter shall be installed at the air inlet assembly (previously attached to the evaporative cooler) and a 160 cfm HEPA filter shall be installed upstream of the existing HEPA filter pit. Butterfly valves in the ventilation system just downstream of where the filters shall be installed can be shut to prevent any emission from the facility during filter installation. Installation of the filters shall be performed in accordance with ALARACT Demonstration 16, TWRS ALARACT Demonstration for Work on Potentially Contaminated Ventilation System Components.

During waste transfer and support activities the tank and vault air space shall be actively ventilated by a temporary ventilation system. The temporary ventilation system shall consist of a portable exhaustor that shall be equipped with compliant monitoring and sampling equipment. The purpose of the exhaustor is to ensure potential airborne contamination from the pits, cells, or process tanks, is not being released to the environment. Operation of the 1,000 cfm portable exhaustor is considered an emissions control.

New waste transfer system, waste staging/consolidation.

The planned transfer system can utilize some existing equipment along with installation of new piping and equipment at 244-CR, ER-153 and/or 244-A Lift Station. Maintenance of the transfer system may be required during the waste staging/consolidation. Equipment, which may require on going maintenance includes but is not limited to leak detection and pump system equipment. The waste can be staged/consolidated in one or two of the 244-CR Facility tanks (CR-001, CR-002, CR-003 and CR-011) prior to transfer to a DST.

The following controls are used for the pit activities:

#### General Controls:

1. Pre-job and post-job radiation surveys are performed by radiation protection technicians. Radiation work permits specify permissible occupational radiological limits during activities. Radiation control technicians' survey and release equipment, inspect and approve required containment, and provide radiological surveys to verify compliance to radiation work permit limits.
2. Pit work is shut down (or not initiated) when sustained wind speeds exceed 25 miles per hour as measured in the field and/or reported by the Hanford Meteorological Station.

3. Fixatives shall be applied inside the pit (with cover blocks on or off) or accessible portions of the pit decontaminated to less than 100,000 disintegrations per minute/100 square centimeters beta-gamma and 2,000 disintegrations per minute/100 square centimeters alpha.

4. When cover blocks are removed, a fall protection handrail is installed. This handrail is draped in plastic forming a contamination barrier. The plastic extends to the top of the pit and is taped or sealed at the top of the pit. Decontamination of the containment barrier is conducted as required by the job specific radiation work permit.

5. Radiation control technicians monitor the affected work area when the vault foam covering is removed, when jumpers and equipment are being removed from risers and nozzles, and when risers are entered for sampling of tanks and sumps. Jumpers removed from the pit are drained of free liquid and decontaminated or contained before removal. The outer-most container shall not exceed 1,000 disintegrations per minute/100 square centimeters beta/gamma and 20 disintegrations per minute/100 square centimeters alpha. If these limits are exceeded, surfaces shall be decontaminated. Disposition of non reusable equipment waste shall be performed in accordance with ALARACT Demonstration 4, TWRS ALARACT Demonstration for packaging and transportation of waste.

6. A bullpen designed to minimize the top opening shall be used. Pit covers or cover blocks will be removed as necessary. If the bullpen is to be left unattended at any time, a temporary cover is placed over the pit or the pit covers or cover blocks are reinstalled. Two tents shall be erected over two pits. Upon completion of the work in the first two 244-CR Facility instrumentation pits, the tents will be relocated to the other 244-CR facility instrumentation pits.

7. PTRAEU(s) shall actively ventilate the bullpens during activities that require work in the pits (after removal of the cover blocks) to control radiological releases. The PTRAEU(s) shall operate intermittently and shall be operated in accordance with the latest revision to the WDOH approved. Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).

8. A compliant exhaust skid shall ventilate the process cells and tanks during waste transfer activities. The exhaust skid shall maintain a negative pressure under the cover blocks and prevent contaminants from reaching the environment. The exhaust skid shall be connected to the existing exhaust ductwork with rigid or flexible ductwork.

9. The 1,000 cfm exhaust skid shall be equipped with a two-stage HEPA filter, which meets the requirements of ASME AG-1, Section FC and shall be tested annually to requirements of ASME N510. The HEPA filters shall have an efficiency of 99.95 percent for 0.3-micron median diameter. Each filter housing shall meet the applicable sections of ASME N509 and the test requirement of ASME N510. The exhaust stack houses a Generic Effluent Monitoring System (GEMS) that contains an air velocity probe and the air sampling probe.

10. The breather filter shall consist of a housing that contains a HEPA filter, an outlet screen, and a small seal loop. Air flowing to and from the 244-CR Facility shall pass horizontally through the filter and vertically through the downward-facing exit weather hood. Seal loops, installed in the exhaust lines, are designed as a safety feature to prevent unlikely accident in which an over pressurization occurs when the HEPA filter is isolated for occasional (infrequent) maintenance.

Specific Controls include:

-Installation of portable 1,000 cfm exhaust skid shall use ALARACT 16.

- Removal and/or installation of vault foam covering - ALARACT 4.
- Application of fixative at pit interior - see General Controls.
- Temporary power installation - ALARA.
- Operation of PTRAEU for bullpen ventilation - Latest WDOH approval, AIR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).
- Removal and/or installation of pit covers - General Controls.
- Inspection of pits, vaults, and tanks - General Controls.
- Removal and disposition of excess equipment and waste in pits, risers, and tanks - ALARACT 15, and ALARACT 4.
- Decontamination activities - General Controls.
- Measurement of liquid level and sludge levels in tanks and sumps - General Controls.
- Sampling activities in pits, vaults, and tanks including chemical addition and/or waste sampling to determine Double Shell Tank waste acceptance - ALARACT 7 and ALARACT 1.
- Facility Equipment Activities: installation, disconnection, repair, replacement, and/or leak testing, of new and existing facility equipment (valves, jumpers, pumps, leak detectors, or other instrumentation/equipment) - ALARACT 4, and ALARACT 15.
- Modifications, maintenance, and/or isolation and sealing of existing in route pits, vaults and piping (drain and transfer lines) to support and/or installation of new transfer lines - General Controls.
- Excavation - ALARACT 5, and/or WDOH approved Site Wide Guzzler NOC (Air 98-1215), or the most current NOC approved for Guzzler use.
- Installation of permanent power to 244-CR Vault Facility - ALARA.
- Installation of passive breather filter assembly - ALARACT 16.
- Operation of a portable exhauster at 244-CR vault for ventilation - ALARA.
- New waste transfer system, waste staging/consolidation - General Controls.

**4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Ac - 227	1.60E-05	Am - 241	8.39E-04	Am - 243	1.26E-07
Ba - 137 m	4.81E-01	C - 14	2.76E-05	Cd - 113 m	1.90E-04
Cm - 242	1.56E-05	Cm - 243	1.85E-05	Cm - 244	4.24E-05
Co - 60	1.33E-03	Cs - 134	1.71E-06	Cs - 137	5.08E+01
Eu - 152	4.40E-05	Eu - 154	5.74E-03	Eu - 155	5.19E-03

H-3	3.54E-05	I-129	7.59E-08	Nb-93 m	1.11E-04
Ni-59	7.11E-05	Ni-63	6.99E-03	Np-237	1.82E-04
Pa-231	1.24E-05	Pu-238	8.11E-05	Pu-239	7.99E-03
Pu-240	1.44E-03	Pu-241	1.01E-02	Pu-242	1.26E-02
Ra-226	5.50E-09	Ra-228	2.99E-05	Ru-106	2.54E-07
Sb-125	7.12E-04	Se-78	2.66E-05	Sm-151	9.77E-02
Sn-126	4.18E-05	Sr-90	4.93E+00	Tc-99	3.25E-04
Th-232	2.63E-07	Th-232	4.89E-05	U-232	6.40E-05
U-233	2.45E-05	U-234	1.81E-05	U-235	6.78E-07
U-238	4.08E-07	U-238	5.77E-06	Y-90	4.91E+00
Zr-93	9.68E-05				

- 5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- 7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 10) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable

standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

- 17) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

- 18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
- 21) Diffuse/Fugitive emissions shall be monitored using the 200 Area near-field ambient air monitors. Sample collection and analysis shall follow that of the near field monitoring program. Analytical results shall be reported in the Annual Air Emissions Report. Any change to this near-field ambient monitoring program must be approved by the department.
- 22) When a Portable/Temporary Radioactive Air Emission Unit (PTRAEU) is used to ventilate the bullpens, the conditions, controls, monitoring requirements and limitations of the PTRAEU NOC, latest approved version, shall be required.
- 23) Excavation of contaminated soils using heavy equipment shall follow the requirements of the Site Wide Guzzler NOC.
- 24) All above ground transfers shall be double contained and the hose in hose connections leak tested.

- 25) If pressures above 50 psi are used, WDOH shall be notified with the controls to be used.
- 26) WDOH requires that log sheets used are in accordance to PTRAEU NOC (DOE/RL -96-75).
- 27) All above ground transfer lines shall be double contained and leak tested.

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

PROJECT TITLE: 244-CR VAULT ISOLATION AND INTERIM STABILIZATION

Date Approved: 31-Dec-02

Emission Unit Name: 296-P-47

Emission Unit ID 498

This is a MAJOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]

BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	Heater		
	Demister		
	Prefilter		
	HEPA		Two HEPA filters in series
	Fan		

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedures	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	40 CFR 61, Appendix B, Method 114, latest revision.	All radionuclides which could contribute 10% of the potential EDE.	Change record sample every 2-weeks during emission unit operation.

**Sampling Requirements:** Continuous during emission unit operation.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

10/24/2002 Original NOC approved on December 31, 2002 via AIR 02-1255 and replaces NOC ID 45.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 5.10E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 5.82E+01 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).



- 3) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:  
activities performed at the 244-CR Vault Facility, ER-153 and/or 244-A Lift Station. These activities include:

**Work Area Preparation:**

- Miscellaneous work including equipment delivery, movement, set up and maintenance in the general work area around the 244-CR Vault Facility.
- Construction and take down of open top containment tents (bullpens) over the facility vault area.
- Installation of Portable/Temporary Radioactive Air Emission Unit(s) (PTRAEUs).
- Installation of portable 1,000 cubic feet per minute (cfm) exhausters.
- Removal and/or installation of vault foam covering.
- Application of fixative at pit interior.
- Temporary power installation.

**Facility/Interim Stabilization Work:**

- Operation of PTRAEU for bullpen ventilation.
- Removal and/or installation of pit covers.
- Inspection of pits, vaults, and tanks.
- Removal and disposition of excess equipment and waste in pits, risers, and tanks.
- Decontamination activities.
- Measurement of liquid level and sludge levels in tanks and sumps.
- Sampling activities in pits, vaults, and tanks including chemical addition and/or waste sampling to determine Double Shell Tank waste acceptance.

**Facility Equipment Activities:**

- Installation, disconnection, repair, replacement, and/or leak testing, of new and existing facility equipment (valves, jumpers, pumps, leak detectors, or other instrumentation/equipment).
- Modifications, maintenance, and/or isolation and sealing of existing risers, pits, vaults and incoming and/or outgoing piping (drain and transfer lines) from 244-CR Vault or connected facility.

**Excavation:**

- Installation of permanent power to 244-CR Vault Facility.
- Installation/Operation of Passive Breather Filter Assembly.

**Waste Transfer and Support Activities:**

- Operation of 1,000 cfm portable exhausters at 244-CR Vault.
- New waste transfer system, waste staging/consolidation.

**Miscellaneous activities shall include:**

- Construction and take down of open top contaminant tents over the facility vault area.
- Open top containment tents (bullpens) shall be constructed over the facility pit area to prevent potential airborne contamination from the effected work area to the environment. Two bullpens shall be erected around two instrumentation pits at the 244-CR Vault. Upon completion of the first pit's work, the bullpens shall be relocated to the other two pits and their work will be completed.
- Installation of Portable/Temporary Radioactive Air Emission Unit(s) (PTRAEUs)
  - A Portable/Temporary Radioactive Air Emission Unit (2,000 cfm) or units (1,000 cfm each) shall be installed to ventilate the bullpens during activities that require work in the pits, cells and tank vault area prior to performing waste transfer activities. One thousand cfm PTRAEUs, if used, shall be directly connected to individual bullpens, while a 2,000 PTRAEU if used, shall be connected to two bullpens. Movement and installation of the PTRAEU can be performed to facilitate ventilation for the four vaults of the 244-CR Vault Facility. The PTRAEU shall operate intermittently (during work activities) and will be operated in accordance with the latest WDOH approval, AIR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).

A portable 1,000 cfm exhausters shall be installed to ventilate the 244-CR Facility vaults and tanks during waste transfer activities. This exhausters shall operate intermittently to support waste transfer and support activities and shall monitor air emissions. The exhausters shall be piped into the existing 244-CR facility ventilation system upstream of the existing (non-operating) exhausters, 296-C-05 and HEPA filters. The existing 244-CR Facility exhaust system shall be isolated and not used. Tie in of the 1,000 cfm exhausters to the existing exhaust system shall be in accordance with ALARACT 16, Tank Farm ALARACT Demonstration for Work on Potentially Contaminated Ventilation System Components. After the waste transfer is completed, the exhausters shall be removed in accordance to the requirements of ALARACT 16.

A foam covering has been placed over the 244-CR Vault area to prevent intrusion of precipitation and snowmelt. In order to gain access to the pit cover (metal) plates or concrete cover blocks, sections of the foam shall be removed, packaged, transported and disposed of. ALARACT 4, Tank Farm ALARACT Demonstration for Packaging and Transportation of Waste shall be used to properly disposition the removed foamed covering. Radiation control technicians (RCT) shall monitor the affected work area while the foam covering is being removed. The foam covering shall be replaced after work is complete, as part of intrusion prevention measures completed by the project following waste transfer activities.

A fixative shall be applied either with the pit covers on. The fixatives shall be applied to pit surfaces through a port in the pit cover using a 'whirly' or by fogging. A hand held sprayer is used to apply fixatives to local areas within the pit when the pit cover is off.

Temporary power installation will be limited to meet the needs to support the work described in this NOC. Temporary installations can be removed when no longer needed.

#### Operation of PTRAEU for Bullpen Ventilation.

Ventilation of the bullpens during pre waste transfer tank activities and prior to the installation of the 1,000 cfm portable exhaustor shall be accomplished with the use of PTRAEU(s). The PTRAEU(s) shall be operated in accordance with the latest WDOH approval, AIR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).

Concrete cover key blocks are removed first, and only blocks necessary to perform intended work are removed. Consideration is given to sliding blocks to minimize the number of blocks to be removed. As discussed in the following, pit covers are decontaminated and/or covered with fixative before removal. Pit Covers are raised a minimum distance to safely allow a radiation protection technician to perform a dose rate and contamination survey. Pit covers are wrapped in plastic and set down in a specially prepared lay-down area. On completion of activities, the plastic wrap is removed from the pit covers and the pit covers are re-installed in their original position and orientation. Post-job surveys are performed.

Inspections, such as visual, video, or nondestructive inspections, shall be performed with pit covers in place (for pit with access ports) or removed. The pit cover design, historical inspection information, and ALARA information shall be used to determine whether the inspection shall be performed manually (with pit cover removed) or remotely with a camera and the pit covers in place.

Excess equipment and debris currently located in the 244-CR vault pits, and in-tank equipment shall be removed to accommodate new waste transfer equipment and piping. Excess equipment shall be replaced with replacement in kind equipment, as necessary.

To facilitate the removal and disposition of these items, size reduction and decontamination activities shall be utilized. Size reduction activities shall include cutting up unusable equipment (usually jumpers/blanks) remotely, using hydraulic shears or low revolutions per minute portable band saws. All size reduction activities shall be performed in accordance with ALARACT Demonstration 15, TWRS ALARACT Demonstration for Size Reduction of Waste Equipment for Disposal.

Disposition of excess equipment and waste shall be performed in accordance with ALARACT Demonstration 4, TWRS ALARACT Demonstration for packaging and transportation of waste.

Removable contamination in the accessible portions of the pit is reduced to less than 100,000 disintegrations per minute/100 square centimeters beta/gamma and 2,000 disintegrations per minute/100 square centimeters alpha by washing, or an approved fixative is applied to pit surfaces. Initial washing with a low pressure (125 pounds per square inch gauge), or high pressure (3,000 pounds per square inch gauge) 'whirly' is accomplished through a port in the pit cover blocks. Additional decontamination activities (with the cover block off) include the use of chemicals, peel and strip paints, water, or manual scrub brushes.

After a section of equipment has been washed it shall be pulled into plastic sleeving and sealed by horse

tailing and lapping.

Liquid and sludge levels are determined using zip cords or other appropriate means that shall not disturb the waste more than zip cords.

Sampling activities shall be performed in the tank and sump area of 244-CR Vault by way of risers in the riser pit in accordance with ALARACT 7, "Tank Farm ALARACT Demonstration For Tank Waste Grab Sampling." Radiological controls for riser preparation/opening listed in ALARACT 1, "Tank Farm ALARACT Demonstration for Riser Preparation/opening," shall be followed.

The waste transfer processes shall transfer waste from tanks CR-011, CR-001, CR-002 and CR-003 and sumps within 244-CR Vault Facility to a staging tank within the 244-CR Facility. The transfer system to consolidate the waste from individual tanks consists of above ground piping of a hose in hose with leak detection at each tank's pit being utilized to support the transfer line. Mixing and dilution of the waste may take place at the receiving tank or within the transfer lines directly. The transfer system may include equipment pump skids and shall include appropriate connections to the transfer lines to accommodate chemical and water addition to the 244-CR Facility tanks and mixing prior to transfer to the designated Double Shell Tank (DST).

Before entry into a pit, an evaluation is made by engineering and/or operations personnel to determine the transfer routing configuration after pit work is complete. On removal of cover blocks, a visual inspection of pit contents is made to verify present configuration.

Tools such as impact wrenches, T-bars, and pike poles are used to repair or replace pit equipment. All equipment coming out of the pit is wrapped in plastic or otherwise contained or decontaminated for reuse or disposal. Removable contamination on the outer-most container shall not exceed 1,000 disintegrations per minute/100 square centimeters beta/gamma and 20 disintegrations per minute/100 square centimeters alpha before removal from the bullpen. Disposition of non reusable equipment waste shall be performed in accordance with ALARACT Demonstration 4, TWR5 ALARACT Demonstration for packaging and transportation of waste.

Jumper work shall be preceded by flushing the appropriate transfer lines with water. Jumper work is accomplished remotely, using a crane to maneuver heavy equipment and parts. Installation, disconnection, and/or changing jumpers/blanks are accomplished by slowly loosening the jumper/blank at the connector head. The required jumper/blank is positioned and tightened to the new connector heads. If the process line or equipment being worked on is connected physically to other unnecessary transfer lines, or if the line is to be left unused, a cap, blank, or equivalent is installed on all open nozzles not connected to jumpers.

Leak testing of newly installed jumpers/blanks shall be performed with pressurized water before initiating waste transfers. Occasionally, a jumper leak test is performed during the initial stages of the transfer. In either case, cover blocks shall be in place before leak testing is performed.

Cutting up unusable pit equipment (usually jumpers/blanks) is accomplished remotely using hydraulic shears or low revolutions per minute portable hand saws. Cutting activities shall be performed in the bullpen or in glovebags. The goal shall be to maintain a contamination level equal to or less than 1,000 dpm/100 cm<sup>2</sup> beta gamma and 20 dpm/100 cm<sup>2</sup> alpha, during cutting activities, but may not always be attainable. RCT coverage shall be provided. Should contamination levels exceed 1,000-dpm/100 cm<sup>2</sup> additional sleeving, or use of a glove bag shall be used and/or decontamination activities performed to lower the levels in accordance with ALARA. Welding (if required) shall commence once removable

contamination levels in the cut and weld area are reduced to ALARA. Size reduction (cutting) activities shall be performed in accordance with ALARACT Demonstration 15, TWRS ALARACT Demonstration for Size Reduction of Waste Equipment for Disposal. To ensure that water intrusions or potential residual waste in piping are eliminated from the facility, existing piping and transfer lines to and from the 244-CR Vault facility shall be blanked, grouted, or sealed. The isolation includes activities such as installing plugs, caps, blind flanges, or grouting. Isolations may occur at the 244-CR riser pit area or at the other end of the pipe in a diversion or valve box, at the ER153 or the 244A Lift Station.

Modifications to existing in-route pits, vaults and piping shall be required to establish the waste transfer route or to ensure the integrity of the system prior to waste transfer. These modifications can include but are not limited to, removal of existing parts and replacement with like parts, installation of new jumpers, or blanking off of equipment. When possible existing blanks shall be utilized. Pipe cutting shall be minimized in compliance with ALARA. If it is determined that the installation of a new above ground transfer line would be the best engineering method to establish a waste transfer route, a temporary transfer route shall be established following existing design and installation procedures. This temporary route will be either above ground or in a shallow trench. If a trench is required excavation shall be performed as described under that activity in this NOC.

Pit drains are checked using water from a tanker truck or another source. Water at a flow rate of approximately 20 gallons per minute is added to a pit drain line and subsequently monitored to verify the pit drains are free of restrictions. At times it might be necessary to pump the DCRT that receives the water after the water passes through the pit drain if the volume of test water approaches the capacity of the DCRT.

Either flushing with water and/or using a retrieval tool to remove debris from the drain are used to clear plugged drains. Water supply valves are opened slowly to minimize splashing. Pressures above 50 pounds per square inch gauge require approval from the engineering organization. Cover blocks shall remain in place and work is accomplished through a penetration in the cover block.

The waste transfer operations involve the pumping of liquid waste that contains dissolved solids. These solids can precipitate out of solution anywhere in the transfer path and cause blockage. If blockage is detected in the system, flushing the lines with hot water is necessary. The hot water is introduced to the system to be flushed through a pressure manifold by piping connected directly to a jumper or nozzle. These operations shall be performed with the pit covers on.

To ensure that water intrusions are eliminated from the facility, a foam covering will be placed over the 244-CR Vault area after completion of isolation activities.

Other techniques to free blockages could include pressurization, temporary jumpers, and hydraulic scouring. All piping connections are designed to be leak tight and the pit cover block shall be installed before pressurization. If pressurization beyond that obtained from the tank farms water system or supply truck (i.e., approximately 150 pounds per square inch gauge) is necessary to remove blockage, an engineering evaluation shall be performed to determine the maximum allowable pressure for operation.

#### Excavation:

Excavation may be required to support installation of ventilation, electrical support and waste transfer equipment. Modifications to existing in route pits, vaults and piping and/or to support installation of new waste transfer lines from the 244-CR Facility to the identified DST may require excavation. Soil excavation activities will be performed in accordance with ALARACT Demonstration 5, TWRS

ALARACT Demonstration for Soil Excavation (Using Hand Tools), and will follow the radiological controls specified in that ALARACT.

Any Guzzler excavations in contamination areas will be performed in accordance with the December 18, 1998, WDOH approved Site Wide Guzzler NOC (Air 98-1215), or the most current NOC approved for Guzzler use. Excavation of contaminated soils using heavy equipment shall follow the requirement of Site Wide Guzzler NOC.

Soil excavation outside the tank farm fence also may be performed with heavy equipment.

Soil will be excavated around the 244-CR vault facility to install new piping, equipment slabs, and new waste transfer system support equipment. It is expected that about 1,000 cubic yards may be excavated, with about 600 cubic yards from inside the tank farm. Backfill shall be from the original removed soil or non-contaminated controlled density fill (sand, water and a small amount of cement).

Current power within the 244-CR Vault Facility is limited. To provide power for new equipment installed under the project, the existing power distribution system shall be upgraded. Upgrades shall involve modification to the existing Motor Control Center (MCC), installation of equipment control panels, and installation of new conduits.

A compliant passive breather filter shall be installed to ventilate the 244-CR Facility vaults and tanks once waste transfer activities are completed. The passive breather filters shall be installed at two locations in the 244-CR facility. A 1,000 cfm HEPA filter shall be installed at the air inlet assembly (previously attached to the evaporative cooler) and a 160 cfm HEPA filter shall be installed upstream of the existing HEPA filter pit. Butterfly valves in the ventilation system just downstream of where the filters shall be installed can be shut to prevent any emission from the facility during filter installation. Installation of the filters shall be performed in accordance with ALARACT Demonstration 16, TWRS ALARACT Demonstration for Work on Potentially Contaminated Ventilation System Components.

During waste transfer and support activities the tank and vault air space shall be actively ventilated by a temporary ventilation system. The temporary ventilation system shall consist of a portable exhauster that shall be equipped with compliant monitoring and sampling equipment. The purpose of the exhauster is to ensure potential airborne contamination from the pits, cells, or process tanks, is not being released to the environment. Operation of the 1,000 cfm portable exhauster is considered an emissions control.

New waste transfer system, waste staging/consolidation.

The planned transfer system can utilize some existing equipment along with installation of new piping and equipment at 244-CR, ER-153 and/or 244-A Lift Station. Maintenance of the transfer system may be required during the waste staging/consolidation. Equipment, which may require on going maintenance includes but is not limited to leak detection and pump system equipment. The waste can be staged/consolidated in one or two of the 244-CR Facility tanks (CR-001, CR-002, CR-003 and CR-011) prior to transfer to a DST.

The following controls are used for the pit activities:

General Controls:

1. Pre-job and post-job radiation surveys are performed by radiation protection technicians. Radiation

work permits specify permissible occupational radiological limits during activities. Radiation control technicians' survey and release equipment, inspect and approve required containment, and provide radiological surveys to verify compliance to radiation work permit limits.

2. Pit work is shut down (or not initiated) when sustained wind speeds exceed 25 miles per hour as measured in the field and/or reported by the Hanford Meteorological Station.
3. Fixatives shall be applied inside the pit (with cover blocks on or off) or accessible portions of the pit decontaminated to less than 100,000 disintegrations per minute/100 square centimeters beta-gamma and 2,000 disintegrations per minute/100 square centimeters alpha.
4. When cover blocks are removed, a fall protection handrail is installed. This handrail is draped in plastic forming a contamination barrier. The plastic extends to the top of the pit and is taped or sealed at the top of the pit. Decontamination of the containment barrier is conducted as required by the job specific radiation work permit.
5. Radiation control technicians monitor the affected work area when the vault foam covering is removed, when jumpers and equipment are being removed from risers and nozzles, and when risers are entered for sampling of tanks and sumps. Jumpers removed from the pit are drained of free liquid and decontaminated or contained before removal. The outer-most container shall not exceed 1,000 disintegrations per minute/100 square centimeters beta/gamma and 20 disintegrations per minute/100 square centimeters alpha. If these limits are exceeded, surfaces shall be decontaminated. Disposition of non reusable equipment waste shall be performed in accordance with ALARACT Demonstration 4, TWRS ALARACT Demonstration for packaging and transportation of waste.
6. A bullpen designed to minimize the top opening shall be used. Pit covers or cover blocks will be removed as necessary. If the bullpen is to be left unattended at any time, a temporary cover is placed over the pit or the pit covers or cover blocks are reinstalled. Two tents shall be erected over two pits. Upon completion of the work in the first two 244-CR Facility instrumentation pits, the tents will be relocated to the other 244-CR facility instrumentation pits.
7. PTRAEU(s) shall actively ventilate the bullpens during activities that require work in the pits (after removal of the cover blocks) to control radiological releases. The PTRAEU(s) shall operate intermittently and shall be operated in accordance with the latest revision to the WDOH approved. Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).
8. A compliant exhaustor skid shall ventilate the process cells and tanks during waste transfer activities. The exhaustor shall maintain a negative pressure under the cover blocks and prevent contaminants from reaching the environment. The exhaustor skid shall be connected to the existing exhaust ductwork with rigid or flexible ductwork.
9. The 1,000 cfm exhaustor shall be equipped with a two-stage HEPA filter, which meets the requirements of ASME AG-1, Section FC and shall be tested annually to requirements of ASME N510. The HEPA filters shall have an efficiency of 99.95 percent for 0.3-micron median diameter. Each filter housing shall meet the applicable sections of ASME N509 and the test requirement of ASME N510. The exhaust stack houses a Generic Effluent Monitoring System (GEMS) that contains an air velocity probe and the air sampling probe.
10. The breather filter shall consist of a housing that contains a HEPA filter, an outlet screen, and a small seal loop. Air flowing to and from the 244-CR Facility shall pass horizontally through the filter

and vertically through the downward-facing exit weather hood. Seal loops, installed in the exhaust lines, are designed as a safety feature to prevent unlikely accident in which an over pressurization occurs when the HEPA filter is isolated for occasional (infrequent) maintenance.

Specific Controls include:

- Installation of portable 1,000 cfm exhausters shall use ALARACT 16.
- Removal and/or installation of vault foam covering - ALARACT 4.
- Application of fixative at pit interior - see General Controls.
- Temporary power installation - ALARA.
- Operation of PTRAEU for bullpen ventilation - Latest WDOH approval, AIR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).
- Removal and/or installation of pit covers - General Controls.
- Inspection of pits, vaults, and tanks - General Controls.
- Removal and disposition of excess equipment and waste in pits, risers, and tanks - ALARACT 15, and ALARACT 4.
- Decontamination activities - General Controls.
- Measurement of liquid level and sludge levels in tanks and sumps - General Controls.
- Sampling activities in pits, vaults, and tanks including chemical addition and/or waste sampling to determine Double Shell Tank waste acceptance - ALARACT 7 and ALARACT 1.
- Facility Equipment Activities: installation, disconnection, repair, replacement, and/or leak testing, of new and existing facility equipment (valves, jumpers, pumps, leak detectors, or other instrumentation/equipment) - ALARACT 4, and ALARACT 15.
- Modifications, maintenance, and/or isolation and sealing of existing in route pits, vaults and piping (drain and transfer lines) to support and/or installation of new transfer lines - General Controls.
- Excavation - ALARACT 5, and/or WDOH approved Site Wide Guzzler NOC (Air 98-1215), or the most current NOC approved for Guzzler use.
- Installation of permanent power to 244-CR Vault Facility - ALARA.
- Installation of passive breather filter assembly - ALARACT 16.
- Operation of a portable exhauster at 244-CR vault for ventilation - ALARA.
- New waste transfer system, waste staging/consolidation - General Controls.



4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):

Ac - 227	9.90E-01	Am - 241	5.00E+01	Am - 243	7.83E-03
Ba - 137 m	2.98E+04	C - 14	1.71E-01	Cd - 113 m	1.18E+01
Cm - 242	9.68E-01	Cm - 243	1.15E-01	Cm - 244	2.63E+00
Co - 60	6.23E+01	Cs - 134	1.06E-01	Cs - 137	3.15E+04
Eu - 152	2.73E+00	Eu - 154	3.56E+02	Eu - 155	3.22E+02
H - 3	2.20E+00	I - 129	4.71E-03	Nb - 93 m	6.88E+00
Ni - 59	4.41E+00	Ni - 63	4.33E+02	Np - 237	1.13E+01
Pa - 231	7.67E-04	Pu - 238	5.03E+00	Pu - 239	4.97E+02
Pu - 240	8.96E+01	Pu - 241	6.26E+02	Pu - 242	7.82E+02
Ra - 226	3.41E-04	Ra - 228	1.85E+00	Ru - 106	1.57E-02
Sb - 125	4.41E+01	Se - 79	1.64E+00	Sm - 151	6.06E+03
Sn - 126	2.59E+00	Sr - 90	3.04E+05	Tc - 99	2.02E+01
Th - 229	1.63E-02	Th - 232	3.10E+00	U - 232	3.97E-01
U - 233	1.52E+00	U - 234	9.99E-01	U - 235	4.20E-02
U - 236	2.53E-02	U - 238	3.58E-01	Y - 90	3.04E+05
Zr - 93	6.00E+00				

- 5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- 7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 10) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC

246-247-080(2)).

- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).
- 17) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

- 18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
- 21) Diffuse/Fugitive emissions shall be monitored using the 200 Area near-field ambient air monitors. Sample collection and analysis shall follow that of the near field monitoring program. Analytical results shall be reported in the Annual Air Emissions Report. Any change to this near-field ambient monitoring program must be approved by the department.
- 22) Within one year of initial use of the exhauster the emission unit monitoring system shall have the following activities performed:

- a. Inspect pitot tube systems for leaks, at least annually.
- b. Inspect nozzles for alignment, presence of deposits, damage to sharp-edged nozzles, or other potentially degrading factors (corrosion, physical damage, etc) at least annually.
- c. Check transport lines and if visible deposits are presents perform cleaning, at least annually.
- d. Checks to ensure the tightness of all fittings and connections as well as a leak test of the sample system, at least annually.
- e. Inspect rotameters of sampling systems for presence of foreign matter at the start of each sampling period.
- f. Check the response of stack flow rate monitoring and control system at least quarterly.
- g. A functional/calibration check of monitoring system instrumentation shall be performed at least annually.
- h. USDOE shall provide to WDOH for review and approval copies of the procedures used to perform the above activities.

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

**PROJECT TITLE: 244-CR VAULT ISOLATION AND INTERIM STABILIZATION**

**Date Approved: 31-Dec-02**

**Emission Unit Name: 244-CR VAULT PASSIVE FILTER A**

**Emission Unit ID 713**

This is a MINOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: ALARACT

ALARACT (WAC 246-247-040(4))  
BARCT (WAC 246-247-040(3))

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA		Single Passive HEPA Filter

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075(3)		Levels below 10,000 dpm/100cm <sup>2</sup> beta/gamma and 200 dpm/100cm <sup>2</sup> alpha will verify low emissions.	1 per year

Sampling Requirements: PCM will be a smear survey on the inside surface of the ducting and downstream of the HEPA filter or on the outside of the screen covering the outlet of the vent

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

10/24/2002 Original NOC approved on December 31, 2002 via AIR 02-1255 and replaces NOC ID 45.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 5.10E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 5.82E+01 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).
- 3) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:  
activities performed at the 244-CR Vault Facility, ER-153 and/or 244-A Lift Station. These activities include:

#### **Work Area Preparation:**

- Miscellaneous work including equipment delivery, movement, set up and maintenance in the general work area around the 244-CR Vault Facility.
- Construction and take down of open top containment tents (bullpens) over the facility vault area.
- Installation of Portable/Temporary Radioactive Air Emission Unit(s) (PTRAEUs).
- Installation of portable 1,000 cubic feet per minute (cfm) exhausters.
- Removal and/or installation of vault foam covering.
- Application of fixative at pit interior.
- Temporary power installation.

#### **Facility/Interim Stabilization Work:**

- Operation of PTRAEU for bullpen ventilation.
- Removal and/or installation of pit covers.
- Inspection of pits, vaults, and tanks.
- Removal and disposition of excess equipment and waste in pits, risers, and tanks.
- Decontamination activities.
- Measurement of liquid level and sludge levels in tanks and sumps.
- Sampling activities in pits, vaults, and tanks including chemical addition and/or waste sampling to determine Double Shell Tank waste acceptance.

#### **Facility Equipment Activities:**

- Installation, disconnection, repair, replacement, and/or leak testing, of new and existing facility equipment (valves, jumpers, pumps, leak detectors, or other instrumentation/equipment).
- Modifications, maintenance, and/or isolation and sealing of existing risers, pits, vaults and incoming and/or outgoing piping (drain and transfer lines) from 244-CR Vault or connected facility.

#### **Excavation:**

- Installation of permanent power to 244-CR Vault Facility.
- Installation/Operation of Passive Breather Filter Assembly.

#### **Waste Transfer and Support Activities:**

- Operation of 1,000 cfm portable exhauster at 244-CR Vault.
- New waste transfer system, waste staging/consolidation.

Miscellaneous activities shall include:

- Construction and take down of open top contaminant tents over the facility vault area.
- Open top containment tents (bullpens) shall be constructed over the facility pit area to prevent potential airborne contamination from the effected work area to the environment. Two bullpens shall be erected around two instrumentation pits at the 244-CR Vault. Upon completion of the first pit's work, the bullpens shall be relocated to the other two pits and their work will be completed.
- Installation of Portable/Temporary Radioactive Air Emission Unit(s) (PTRAEUs)
- A Portable/Temporary Radioactive Air Emission Unit (2,000 cfm) or units (1,000 cfm each) shall be installed to ventilate the bullpens during activities that require work in the pits, cells and tank vault area prior to performing waste transfer activities. One thousand cfm PTRAEUs, if used, shall be directly connected to individual bullpens, while a 2,000 PTRAEU if used, shall be connected to two bullpens. Movement and installation of the PTRAEU can be performed to facilitate ventilation for the four vaults of the 244-CR Vault Facility. The PTRAEU shall operate intermittently (during work activities) and will be operated in accordance with the latest WDOH approval, AIR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).

A portable 1,000 cfm exhauster shall be installed to ventilate the 244-CR Facility vaults and tanks during waste transfer activities. This exhauster shall operate intermittently to support waste transfer and support activities and shall monitor air emissions. The exhauster shall be piped into the existing 244-CR facility ventilation system upstream of the existing (non-operating) exhauster, 296-C-05 and HEPA filters. The existing 244-CR Facility exhaust system shall be isolated and not used. Tie in of the 1,000 cfm exhauster to the existing exhaust system shall be in accordance with ALARACT 16, Tank Farm ALARACT Demonstration for Work on Potentially Contaminated Ventilation System Components. After the waste transfer is completed, the exhauster shall be removed in accordance to the requirements of ALARACT 16.

A foam covering has been placed over the 244-CR Vault area to prevent intrusion of precipitation and snowmelt. In order to gain access to the pit cover (metal) plates or concrete cover blocks, sections of the foam shall be removed, packaged, transported and disposed of. ALARACT 4, Tank Farm ALARACT Demonstration for Packaging and Transportation of Waste shall be used to properly disposition the removed foamed covering. Radiation control technicians (RCT) shall monitor the affected work area while the foam covering is being removed. The foam covering shall be replaced after work is complete, as part of intrusion prevention measures completed by the project following waste transfer activities.

A fixative shall be applied either with the pit covers on. The fixatives shall be applied to pit surfaces through a port in the pit cover using a 'whirly' or by fogging. A hand held sprayer is used to apply fixatives to local areas within the pit when the pit cover is off.

Temporary power installation will be limited to meet the needs to support the work described in this NOC. Temporary installations can be removed when no longer needed.

#### Operation of PTRAEU for Bullpen Ventilation.

Ventilation of the bullpens during pre waste transfer tank activities and prior to the installation of the 1,000 cfm portable exhausters shall be accomplished with the use of PTRAEU(s). The PTRAEU(s) shall be operated in accordance with the latest WDOH approval, AFR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).

Concrete cover key blocks are removed first, and only blocks necessary to perform intended work are removed. Consideration is given to sliding blocks to minimize the number of blocks to be removed. As discussed in the following, pit covers are decontaminated and/or covered with fixative before removal. Pit Covers are raised a minimum distance to safely allow a radiation protection technician to perform a dose rate and contamination survey. Pit covers are wrapped in plastic and set down in a specially prepared lay-down area. On completion of activities, the plastic wrap is removed from the pit covers and the pit covers are re-installed in their original position and orientation. Post-job surveys are performed.

Inspections, such as visual, video, or nondestructive inspections, shall be performed with pit covers in place (for pit with access ports) or removed. The pit cover design, historical inspection information, and ALARA information shall be used to determine whether the inspection shall be performed manually (with pit cover removed) or remotely with a camera and the pit covers in place.

Excess equipment and debris currently located in the 244-CR vault pits, and in-tank equipment shall be removed to accommodate new waste transfer equipment and piping. Excess equipment shall be replaced with replacement in kind equipment, as necessary.

To facilitate the removal and disposition of these items, size reduction and decontamination activities shall be utilized. Size reduction activities shall include cutting up unusable equipment (usually jumpers/blanks) remotely, using hydraulic shears or low revolutions per minute portable band saws. All size reduction activities shall be performed in accordance with ALARACT Demonstration 15, TWRS ALARACT Demonstration for Size Reduction of Waste Equipment for Disposal.

Disposition of excess equipment and waste shall be performed in accordance with ALARACT Demonstration 4, TWRS ALARACT Demonstration for packaging and transportation of waste.

Removable contamination in the accessible portions of the pit is reduced to less than 100,000 disintegrations per minute/100 square centimeters beta/gamma and 2,000 disintegrations per minute/100 square centimeters alpha by washing, or an approved fixative is applied to pit surfaces. Initial washing with a low pressure (125 pounds per square inch gauge), or high pressure (3,000 pounds per square inch gauge) 'whirly' is accomplished through a port in the pit cover blocks. Additional decontamination activities (with the cover block off) include the use of chemicals, peel and strip paints, water, or manual scrub brushes.

After a section of equipment has been washed it shall be pulled into plastic sleeving and sealed by horse tailing and taping.

Liquid and sludge levels are determined using zip cords or other appropriate means that shall not disturb the waste more than zip cords.

Sampling activities shall be performed in the tank and sump area of 244-CR Vault by way of risers in the riser pit in accordance with ALARACT 7, "Tank Farm ALARACT Demonstration For Tank Waste

Grab Sampling." Radiological controls for riser preparation/opening listed in ALARACT 1, "Tank Farm ALARACT Demonstration for Riser Preparation/opening," shall be followed.

The waste transfer processes shall transfer waste from tanks CR-011, CR-001, CR-002 and CR-003 and sumps within 244-CR Vault Facility to a staging tank within the 244-CR Facility. The transfer system to consolidate the waste from individual tanks consists of above ground piping of a hose in hose with leak detection at each tank's pit being utilized to support the transfer line. Mixing and dilution of the waste may take place at the receiving tank or within the transfer lines directly. The transfer system may include equipment pump skids and shall include appropriate connections to the transfer lines to accommodate chemical and water addition to the 244-CR Facility tanks and mixing prior to transfer to the designated Double Shell Tank (DST).

Before entry into a pit, an evaluation is made by engineering and/or operations personnel to determine the transfer routing configuration after pit work is complete. On removal of cover blocks, a visual inspection of pit contents is made to verify present configuration.

Tools such as impact wrenches, T-bars, and pike poles are used to repair or replace pit equipment. All equipment coming out of the pit is wrapped in plastic or otherwise contained or decontaminated for reuse or disposal. Removable contamination on the outer-most container shall not exceed 1,000 disintegrations per minute/100 square centimeters beta/gamma and 20 disintegrations per minute/100 square centimeters alpha before removal from the bullpen. Disposition of non reusable equipment waste shall be performed in accordance with ALARACT Demonstration 4, TWRS ALARACT Demonstration for packaging and transportation of waste.

Jumper work shall be preceded by flushing the appropriate transfer lines with water. Jumper work is accomplished remotely, using a crane to maneuver heavy equipment and parts. Installation, disconnection, and/or changing jumpers/blanks are accomplished by slowly loosening the jumper/blank at the connector head. The required jumper/blank is positioned and tightened to the new connector heads. If the process line or equipment being worked on is connected physically to other unnecessary transfer lines, or if the line is to be left unused, a cap, blank, or equivalent is installed on all open nozzles not connected to jumpers.

Leak testing of newly installed jumpers/blanks shall be performed with pressurized water before initiating waste transfers. Occasionally, a jumper leak test is performed during the initial stages of the transfer. In either case, cover blocks shall be in place before leak testing is performed.

Cutting up unusable pit equipment (usually jumpers/blanks) is accomplished remotely using hydraulic shears or low revolutions per minute portable band saws. Cutting activities shall be performed in the bullpen or in glovebags. The goal shall be to maintain a contamination level equal to or less than 1,000 dpm/100 cm<sup>2</sup> beta gamma and 20 dpm/100 cm<sup>2</sup> alpha, during cutting activities, but may not always be attainable. RCT coverage shall be provided. Should contamination levels exceed 1,000-dpm/100 cm<sup>2</sup> additional sleeving, or use of a glove bag shall be used and/or decontamination activities performed to lower the levels in accordance with ALARA. Welding (if required) shall commence once removable contamination levels in the cut and weld area are reduced to ALARA. Size reduction (cutting) activities shall be performed in accordance with ALARACT Demonstration 15, TWRS ALARACT Demonstration for Size Reduction of Waste Equipment for Disposal. To ensure that water intrusions or potential residual waste in piping are eliminated from the facility, existing piping and transfer lines to and from the 244-CR Vault facility shall be blanked, grouted, or sealed. The isolation includes activities such as installing plugs, caps, blind flanges, or grouting. Isolations may occur at the 244-CR riser pit area or at the other end of the pipe in a diversion or valve box, at the ER153 or the 244A Lift Station.



Modifications to existing in-route pits, vaults and piping shall be required to establish the waste transfer route or to ensure the integrity of the system prior to waste transfer. These modifications can include but are not limited to, removal of existing parts and replacement with like parts, installation of new jumpers, or blanking off of equipment. When possible existing blanks shall be utilized. Pipe cutting shall be minimized in compliance with ALARA. If it is determined that the installation of a new above ground transfer line would be the best engineering method to establish a waste transfer route, a temporary transfer route shall be established following existing design and installation procedures. This temporary route will be either above ground or in a shallow trench. If a trench is required excavation shall be performed as described under that activity in this NOC.

Pit drains are checked using water from a tanker truck or another source. Water at a flow rate of approximately 20 gallons per minute is added to a pit drain line and subsequently monitored to verify the pit drains are free of restrictions. At times it might be necessary to pump the DCRT that receives the water after the water passes through the pit drain if the volume of test water approaches the capacity of the DCRT.

Either flushing with water and/or using a retrieval tool to remove debris from the drain are used to clear plugged drains. Water supply valves are opened slowly to minimize splashing. Pressures above 50 pounds per square inch gauge require approval from the engineering organization. Cover blocks shall remain in place and work is accomplished through a penetration in the cover block.

The waste transfer operations involve the pumping of liquid waste that contains dissolved solids. These solids can precipitate out of solution anywhere in the transfer path and cause blockage. If blockage is detected in the system, flushing the lines with hot water is necessary. The hot water is introduced to the system to be flushed through a pressure manifold by piping connected directly to a jumper or nozzle. These operations shall be performed with the pit covers on.

To ensure that water intrusions are eliminated from the facility, a foam covering will be placed over the 244-CR Vault area after completion of isolation activities.

Other techniques to free blockages could include pressurization, temporary jumpers, and hydraulic scouring. All piping connections are designed to be leak tight and the pit cover block shall be installed before pressurization. If pressurization beyond that obtained from the tank farms water system or supply truck (i.e., approximately 150 pounds per square inch gauge) is necessary to remove blockage, an engineering evaluation shall be performed to determine the maximum allowable pressure for operation.

#### Excavation:

Excavation may be required to support installation of ventilation, electrical support and waste transfer equipment. Modifications to existing in route pits, vaults and piping and/or to support installation of new waste transfer lines from the 244-CR Facility to the identified DST may require excavation. Soil excavation activities will be performed in accordance with ALARACT Demonstration 5, TWRS ALARACT Demonstration for Soil Excavation (Using Hand Tools), and will follow the radiological controls specified in that ALARACT.

Any Guzzler excavations in contamination areas will be performed in accordance with the December 18, 1998, WDOH approved Site Wide Guzzler NOC (Air 98-1215), or the most current NOC approved for Guzzler use. Excavation of contaminated soils using heavy equipment shall follow the requirement of Site Wide Guzzler NOC.

Soil excavation outside the tank farm fence also may be performed with heavy equipment.

Soil will be excavated around the 244-CR vault facility to install new piping, equipment slabs, and new waste transfer system support equipment. It is expected that about 1,000 cubic yards may be excavated, with about 600 cubic yards from inside the tank farm. Backfill shall be from the original removed soil or non-contaminated controlled density fill (sand, water and a small amount of cement).

Current power within the 244-CR Vault Facility is limited. To provide power for new equipment installed under the project, the existing power distribution system shall be upgraded. Upgrades shall involve modification to the existing Motor Control Center (MCC), installation of equipment control panels, and installation of new conduits.

A compliant passive breather filter shall be installed to ventilate the 244-CR Facility vaults and tanks once waste transfer activities are completed. The passive breather filters shall be installed at two locations in the 244-CR facility. A 1,000 cfm HEPA filter shall be installed at the air inlet assembly (previously attached to the evaporative cooler) and a 160 cfm HEPA filter shall be installed upstream of the existing HEPA filter pit. Butterfly valves in the ventilation system just downstream of where the filters shall be installed can be shut to prevent any emission from the facility during filter installation. Installation of the filters shall be performed in accordance with ALARACT Demonstration 16, TWRS ALARACT Demonstration for Work on Potentially Contaminated Ventilation System Components.

During waste transfer and support activities the tank and vault air space shall be actively ventilated by a temporary ventilation system. The temporary ventilation system shall consist of a portable exhaustor that shall be equipped with compliant monitoring and sampling equipment. The purpose of the exhaustor is to ensure potential airborne contamination from the pits, cells, or process tanks, is not being released to the environment. Operation of the 1,000 cfm portable exhaustor is considered an emissions control.

New waste transfer system, waste staging/consolidation.

The planned transfer system can utilize some existing equipment along with installation of new piping and equipment at 244-CR, ER-153 and/or 244-A Lift Station. Maintenance of the transfer system may be required during the waste staging/consolidation. Equipment, which may require on going maintenance includes but is not limited to leak detection and pump system equipment. The waste can be staged/consolidated in one or two of the 244-CR Facility tanks (CR-001, CR-002, CR-003 and CR-011) prior to transfer to a DST.

The following controls are used for the pit activities:

#### General Controls:

1. Pre-job and post-job radiation surveys are performed by radiation protection technicians. Radiation work permits specify permissible occupational radiological limits during activities. Radiation control technicians' survey and release equipment, inspect and approve required containment, and provide radiological surveys to verify compliance to radiation work permit limits.
2. Pit work is shut down (or not initiated) when sustained wind speeds exceed 25 miles per hour as measured in the field and/or reported by the Hanford Meteorological Station.

3. Fixatives shall be applied inside the pit (with cover blocks on or off) or accessible portions of the pit decontaminated to less than 100,000 disintegrations per minute/100 square centimeters beta-gamma and 2,000 disintegrations per minute/100 square centimeters alpha.

4. When cover blocks are removed, a fall protection handrail is installed. This handrail is draped in plastic forming a contamination barrier. The plastic extends to the top of the pit and is taped or sealed at the top of the pit. Decontamination of the containment barrier is conducted as required by the job specific radiation work permit.

5. Radiation control technicians monitor the affected work area when the vault foam covering is removed, when jumpers and equipment are being removed from risers and nozzles, and when risers are entered for sampling of tanks and sumps. Jumpers removed from the pit are drained of free liquid and decontaminated or contained before removal. The outer-most container shall not exceed 1,000 disintegrations per minute/100 square centimeters beta/gamma and 20 disintegrations per minute/100 square centimeters alpha. If these limits are exceeded, surfaces shall be decontaminated. Disposition of non reusable equipment waste shall be performed in accordance with ALARACT Demonstration 4, TWRS ALARACT Demonstration for packaging and transportation of waste.

6. A bullpen designed to minimize the top opening shall be used. Pit covers or cover blocks will be removed as necessary. If the bullpen is to be left unattended at any time, a temporary cover is placed over the pit or the pit covers or cover blocks are reinstalled. Two tents shall be erected over two pits. Upon completion of the work in the first two 244-CR Facility instrumentation pits, the tents will be relocated to the other 244-CR facility instrumentation pits.

7. PTRAEU(s) shall actively ventilate the bullpens during activities that require work in the pits (after removal of the cover blocks) to control radiological releases. The PTRAEU(s) shall operate intermittently and shall be operated in accordance with the latest revision to the WDOH approved. Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).

8. A compliant exhaustor skid shall ventilate the process cells and tanks during waste transfer activities. The exhaustor shall maintain a negative pressure under the cover blocks and prevent contaminants from reaching the environment. The exhaustor skid shall be connected to the existing exhaust ductwork with rigid or flexible ductwork.

9. The 1,000 cfm exhaustor shall be equipped with a two-stage HEPA filter, which meets the requirements of ASME AG-1, Section FC and shall be tested annually to requirements of ASME N510. The HEPA filters shall have an efficiency of 99.95 percent for 0.3-micron median diameter. Each filter housing shall meet the applicable sections of ASME N509 and the test requirement of ASME N510. The exhaust stack houses a Generic Effluent Monitoring System (GEMS) that contains an air velocity probe and the air sampling probe.

10. The breather filter shall consist of a housing that contains a HEPA filter, an outlet screen, and a small seal loop. Air flowing to and from the 244-CR Facility shall pass horizontally through the filter and vertically through the downward-facing exit weather hood. Seal loops, installed in the exhaust lines, are designed as a safety feature to prevent unlikely accident in which an over pressurization occurs when the HEPA filter is isolated for occasional (infrequent) maintenance.

Specific Controls include:

-Installation of portable 1,000 cfm exhaustor shall use ALARACT 16.

- Removal and/or installation of vault foam covering - ALARACT 4.
- Application of fixative at pit interior - see General Controls.
- Temporary power installation - ALARA.
- Operation of PTRAEU for bullpen ventilation - Latest WDOH approval, AIR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).
- Removal and/or installation of pit covers - General Controls.
- Inspection of pits, vaults, and tanks - General Controls.
- Removal and disposition of excess equipment and waste in pits, risers, and tanks - ALARACT 15, and ALARACT 4.
- Decontamination activities - General Controls.
- Measurement of liquid level and sludge levels in tanks and sumps - General Controls.
- Sampling activities in pits, vaults, and tanks including chemical addition and/or waste sampling to determine Double Shell Tank waste acceptance - ALARACT 7 and ALARACT 1.
- Facility Equipment Activities: installation, disconnection, repair, replacement, and/or leak testing, of new and existing facility equipment (valves, jumpers, pumps, leak detectors, or other instrumentation/equipment) - ALARACT 4, and ALARACT 15.
- Modifications, maintenance, and/or isolation and sealing of existing in route pits, vaults and piping (drain and transfer lines) to support and/or installation of new transfer lines - General Controls.
- Excavation - ALARACT 5, and/or WDOH approved Site Wide Guzzler NOC (Air 98-1215), or the most current NOC approved for Guzzler use.
- Installation of permanent power to 244-CR Vault Facility - ALARA.
- Installation of passive breather filter assembly - ALARACT 16.
- Operation of a portable exhauster at 244-CR vault for ventilation - ALARA.
- New waste transfer system, waste staging/consolidation - General Controls.

**4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Ac - 227	6.85E-06	Am - 241	3.13E-03	Am - 243	3.96E-05
Ba - 137 m	6.41E+03	C - 14	3.62E-02	Cd - 113 m	1.99E-02
Cm - 242	8.48E-05	Cm - 243	5.01E-04	Cm - 244	9.49E-03
Co - 60	1.31E-03	Cs - 134	4.22E-04	Cs - 137	6.78E+03
Eu - 152	5.31E-02	Eu - 154	7.09E+00	Eu - 155	1.22E+01

H-3	3.57E-01	I-129	6.95E-05	Nb-93 m	8.10E-03
Ni-59	1.88E-01	Ni-63	1.82E+01	Np-237	1.75E-01
Pa-231	3.19E-07	Pu-238	1.75E-01	Pu-239	7.01E+00
Pu-240	1.02E+00	Pu-241	3.86E+00	Pu-242	8.89E+00
Ra-226	5.30E-06	Ra-228	4.68E-05	Ru-106	1.29E-06
Sb-125	1.80E-03	Sa-79	1.88E-02	Sm-151	6.55E+00
Sn-126	2.69E-03	Sr-90	3.02E+04	Tc-99	1.63E+00
Th-228	3.11E-08	Th-232	3.53E-05	U-232	2.61E-03
U-233	1.01E-02	U-234	1.72E-01	U-235	7.81E-03
U-235	1.95E-03	U-238	5.05E-03	Y-90	3.02E+04
Zr-93	6.85E-03				

- 5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- 7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 10) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable

standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

- 17) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

- 18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
- 21) The filter shall be tested in-place annually to the requirements of ASME N510 and have an efficiency of 99.95 percent.

**DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR**

**PROJECT TITLE: 244-CR VAULT ISOLATION AND INTERIM STABILIZATION**

**Date Approved: 31-Dec-02**

**Emission Unit Name: 244-CR VAULT PASSIVE FILTER B**

**Emission Unit ID 714**

This is a MINOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: ALARACT

ALARACT (WAC 246-247-040(4))  
BARCT (WAC 246-247-040(3))

<u>Zone or Area:</u>	<u>Abatement Technology</u>	<u>Required # of Units</u>	<u>Additional Description/Conditions</u>
			Single Passive HEPA Filter

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

<u>Federal and State Regulatory</u>	<u>Monitoring and Testing Procedure</u>	<u>Radionuclides Requiring Measurement</u>	<u>Sampling Frequency</u>
WAC 246-247-075(3)		Levels below 10,000 dpm/100cm <sup>2</sup> beta/gamma and 200 dpm/100cm <sup>2</sup> alpha will verify low emissions.	1 per year

**Sampling Requirements:** PCM will be a smear survey on the inside surface of the ducting and downstream of the HEPA filter or on the outside of the screen covering the outlet of the vent

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

10/24/2002 Original NOC approved on December 31, 2002 via AIR 02-1255 and replaces NOC ID 45.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 5.10E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 5.82E+01 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).
- 3) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:  
activities performed at the 244-CR Vault Facility, ER-153 and/or 244-A Lift Station. These activities include:

#### Work Area Preparation:

- Miscellaneous work including equipment delivery, movement, set up and maintenance in the general work area around the 244-CR Vault Facility.
- Construction and take down of open top containment tents (bullpens) over the facility vault area.
- Installation of Portable/Temporary Radioactive Air Emission Unit(s) (PTRAEUs).
- Installation of portable 1,000 cubic feet per minute (cfm) exhausters.
- Removal and/or installation of vault foam covering.
- Application of fixative at pit interior.
- Temporary power installation.

#### Facility/Interim Stabilization Work:

- Operation of PTRAEU for bullpen ventilation.
- Removal and/or installation of pit covers.
- Inspection of pits, vaults, and tanks.
- Removal and disposition of excess equipment and waste in pits, risers, and tanks.
- Decontamination activities.
- Measurement of liquid level and sludge levels in tanks and sumps.
- Sampling activities in pits, vaults, and tanks including chemical addition and/or waste sampling to determine Double Shell Tank waste acceptance.

#### Facility Equipment Activities:

- Installation, disconnection, repair, replacement, and/or leak testing, of new and existing facility equipment (valves, jumpers, pumps, leak detectors, or other instrumentation/equipment).
- Modifications, maintenance, and/or isolation and sealing of existing risers, pits, vaults and incoming and/or outgoing piping (drain and transfer lines) from 244-CR Vault or connected facility.

#### Excavation:

- Installation of permanent power to 244-CR Vault Facility.
- Installation/Operation of Passive Breather Filter Assembly.

#### Waste Transfer and Support Activities:



- Operation of 1,000 cfm portable exhausters at 244-CR Vault.
- New waste transfer system, waste staging/consolidation.

Miscellaneous activities shall include:

- Construction and take down of open top contaminant tents over the facility vault area.
- Open top containment tents (bullpens) shall be constructed over the facility pit area to prevent potential airborne contamination from the effected work area to the environment. Two bullpens shall be erected around two instrumentation pits at the 244-CR Vault. Upon completion of the first pit's work, the bullpens shall be relocated to the other two pits and their work will be completed.

**- Installation of Portable/Temporary Radioactive Air Emission Unit(s) (PTRAEUs)**

- A Portable/Temporary Radioactive Air Emission Unit (2,000 cfm) or units (1,000 cfm each) shall be installed to ventilate the bullpens during activities that require work in the pits, cells and tank vault area prior to performing waste transfer activities. One thousand cfm PTRAEUs, if used, shall be directly connected to individual bullpens, while a 2,000 PTRAEU if used, shall be connected to two bullpens. Movement and installation of the PTRAEU can be performed to facilitate ventilation for the four vaults of the 244-CR Vault Facility. The PTRAEU shall operate intermittently (during work activities) and will be operated in accordance with the latest WDOH approval, AIR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).

A portable 1,000 cfm exhauster shall be installed to ventilate the 244-CR Facility vaults and tanks during waste transfer activities. This exhauster shall operate intermittently to support waste transfer and support activities and shall monitor air emissions. The exhauster shall be piped into the existing 244-CR facility ventilation system upstream of the existing (non-operating) exhauster, 296-C-05 and HEPA filters. The existing 244-CR Facility exhaust system shall be isolated and not used. Tie in of the 1,000 cfm exhauster to the existing exhaust system shall be in accordance with ALARACT 16, Tank Farm ALARACT Demonstration for Work on Potentially Contaminated Ventilation System Components. After the waste transfer is completed, the exhauster shall be removed in accordance to the requirements of ALARACT 16.

A foam covering has been placed over the 244-CR Vault area to prevent intrusion of precipitation and snowmelt. In order to gain access to the pit cover (metal) plates or concrete cover blocks, sections of the foam shall be removed, packaged, transported and disposed of. ALARACT 4, Tank Farm ALARACT Demonstration for Packaging and Transportation of Waste shall be used to properly disposition the removed foamed covering. Radiation control technicians (RCT) shall monitor the affected work area while the foam covering is being removed. The foam covering shall be replaced after work is complete, as part of intrusion prevention measures completed by the project following waste transfer activities.

A fixative shall be applied either with the pit covers on. The fixatives shall be applied to pit surfaces through a port in the pit cover using a 'whirly' or by fogging. A hand held sprayer is used to apply fixatives to local areas within the pit when the pit cover is off.

Temporary power installation will be limited to meet the needs to support the work described in this NOC. Temporary installations can be removed when no longer needed.

#### Operation of PTRAEU for Bullpen Ventilation.

Ventilation of the bullpens during pre waste transfer tank activities and prior to the installation of the 1,000 cfm portable exhaustor shall be accomplished with the use of PTRAEU(s). The PTRAEU(s) shall be operated in accordance with the latest WDOH approval, AIR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).

Concrete cover key blocks are removed first, and only blocks necessary to perform intended work are removed. Consideration is given to sliding blocks to minimize the number of blocks to be removed. As discussed in the following, pit covers are decontaminated and/or covered with fixative before removal. Pit Covers are raised a minimum distance to safely allow a radiation protection technician to perform a dose rate and contamination survey. Pit covers are wrapped in plastic and set down in a specially prepared lay-down area. On completion of activities, the plastic wrap is removed from the pit covers and the pit covers are re-installed in their original position and orientation. Post-job surveys are performed.

Inspections, such as visual, video, or nondestructive inspections, shall be performed with pit covers in place (for pit with access ports) or removed. The pit cover design, historical inspection information, and ALARA information shall be used to determine whether the inspection shall be performed manually (with pit cover removed) or remotely with a camera and the pit covers in place.

Excess equipment and debris currently located in the 244-CR vault pits, and in-tank equipment shall be removed to accommodate new waste transfer equipment and piping. Excess equipment shall be replaced with replacement in kind equipment, as necessary.

To facilitate the removal and disposition of these items, size reduction and decontamination activities shall be utilized. Size reduction activities shall include cutting up unusable equipment (usually jumpers/blanks) remotely, using hydraulic shears or low revolutions per minute portable band saws. All size reduction activities shall be performed in accordance with ALARACT Demonstration 15, TWRS ALARACT Demonstration for Size Reduction of Waste Equipment for Disposal.

Disposition of excess equipment and waste shall be performed in accordance with ALARACT Demonstration 4, TWRS ALARACT Demonstration for packaging and transportation of waste.

Removable contamination in the accessible portions of the pit is reduced to less than 100,000 disintegrations per minute/100 square centimeters beta/gamma and 2,000 disintegrations per minute/100 square centimeters alpha by washing, or an approved fixative is applied to pit surfaces. Initial washing with a low pressure (125 pounds per square inch gauge), or high pressure (3,000 pounds per square inch gauge) 'whirly' is accomplished through a port in the pit cover blocks. Additional decontamination activities (with the cover block off) include the use of chemicals, peel and strip paints, water, or manual scrub brushes.

After a section of equipment has been washed it shall be pulled into plastic sleeving and sealed by horse tailing and taping.

Liquid and sludge levels are determined using zip cords or other appropriate means that shall not disturb the waste more than zip cords.

Sampling activities shall be performed in the tank and sump area of 244-CR Vault by way of risers in the riser pit in accordance with ALARACT 7, "Tank Farm ALARACT Demonstration For Tank Waste

**Grab Sampling.** Radiological controls for riser preparation/opening listed in ALARACT 1, "Tank Farm ALARACT Demonstration for Riser Preparation/opening," shall be followed.

The waste transfer processes shall transfer waste from tanks CR-011, CR-001, CR-002 and CR-003 and sumps within 244-CR Vault Facility to a staging tank within the 244-CR Facility. The transfer system to consolidate the waste from individual tanks consists of above ground piping of a hose in hose with leak detection at each tank's pit being utilized to support the transfer line. Mixing and dilution of the waste may take place at the receiving tank or within the transfer lines directly. The transfer system may include equipment pump skids and shall include appropriate connections to the transfer lines to accommodate chemical and water addition to the 244-CR Facility tanks and mixing prior to transfer to the designated Double Shell Tank (DST).

Before entry into a pit, an evaluation is made by engineering and/or operations personnel to determine the transfer routing configuration after pit work is complete. On removal of cover blocks, a visual inspection of pit contents is made to verify present configuration.

Tools such as impact wrenches, T-bars, and pike poles are used to repair or replace pit equipment. All equipment coming out of the pit is wrapped in plastic or otherwise contained or decontaminated for reuse or disposal. Removable contamination on the outer-most container shall not exceed 1,000 disintegrations per minute/100 square centimeters beta/gamma and 20 disintegrations per minute/100 square centimeters alpha before removal from the bullpen. Disposition of non reusable equipment waste shall be performed in accordance with ALARACT Demonstration 4, TWRS ALARACT Demonstration for packaging and transportation of waste.

Jumper work shall be preceded by flushing the appropriate transfer lines with water. Jumper work is accomplished remotely, using a crane to maneuver heavy equipment and parts. Installation, disconnection, and/or changing jumpers/blanks are accomplished by slowly loosening the jumper/blank at the connector head. The required jumper/blank is positioned and tightened to the new connector heads. If the process line or equipment being worked on is connected physically to other unnecessary transfer lines, or if the line is to be left unused, a cap, blank, or equivalent is installed on all open nozzles not connected to jumpers.

Leak testing of newly installed jumpers/blanks shall be performed with pressurized water before initiating waste transfers. Occasionally, a jumper leak test is performed during the initial stages of the transfer. In either case, cover blocks shall be in place before leak testing is performed.

Cutting up unusable pit equipment (usually jumpers/blanks) is accomplished remotely using hydraulic shears or low revolutions per minute portable band saws. Cutting activities shall be performed in the bullpen or in glovebags. The goal shall be to maintain a contamination level equal to or less than 1,000 dpm/100 cm<sup>2</sup> beta gamma and 20 dpm/100 cm<sup>2</sup> alpha, during cutting activities, but may not always be attainable. RCT coverage shall be provided. Should contamination levels exceed 1,000-dpm/100 cm<sup>2</sup> additional sleeving, or use of a glove bag shall be used and/or decontamination activities performed to lower the levels in accordance with ALARA. Welding (if required) shall commence once removable contamination levels in the cut and weld area are reduced to ALARA. Size reduction (cutting) activities shall be performed in accordance with ALARACT Demonstration 15, TWRS ALARACT Demonstration for Size Reduction of Waste Equipment for Disposal. To ensure that water intrusions or potential residual waste in piping are eliminated from the facility, existing piping and transfer lines to and from the 244-CR Vault facility shall be blanked, grouted, or sealed. The isolation includes activities such as installing plugs, caps, blind flanges, or grouting. Isolations may occur at the 244-CR riser pit area or at the other end of the pipe in a diversion or valve box, at the ER153 or the 244A Lift Station.

Modifications to existing in-route pits, vaults and piping shall be required to establish the waste transfer route or to ensure the integrity of the system prior to waste transfer. These modifications can include but are not limited to, removal of existing parts and replacement with like parts, installation of new jumpers, or blanking off of equipment. When possible existing blanks shall be utilized. Pipe cutting shall be minimized in compliance with ALARA. If it is determined that the installation of a new above ground transfer line would be the best engineering method to establish a waste transfer route, a temporary transfer route shall be established following existing design and installation procedures. This temporary route will be either above ground or in a shallow trench. If a trench is required excavation shall be performed as described under that activity in this NOC.

Pit drains are checked using water from a tanker truck or another source. Water at a flow rate of approximately 20 gallons per minute is added to a pit drain line and subsequently monitored to verify the pit drains are free of restrictions. At times it might be necessary to pump the DCRT that receives the water after the water passes through the pit drain if the volume of test water approaches the capacity of the DCRT.

Either flushing with water and/or using a retrieval tool to remove debris from the drain are used to clear plugged drains. Water supply valves are opened slowly to minimize splashing. Pressures above 50 pounds per square inch gauge require approval from the engineering organization. Cover blocks shall remain in place and work is accomplished through a penetration in the cover block.

The waste transfer operations involve the pumping of liquid waste that contains dissolved solids. These solids can precipitate out of solution anywhere in the transfer path and cause blockage. If blockage is detected in the system, flushing the lines with hot water is necessary. The hot water is introduced to the system to be flushed through a pressure manifold by piping connected directly to a jumper or nozzle. These operations shall be performed with the pit covers on.

To ensure that water intrusions are eliminated from the facility, a foam covering will be placed over the 244-CR Vault area after completion of isolation activities.

Other techniques to free blockages could include pressurization, temporary jumpers, and hydraulic scouring. All piping connections are designed to be leak tight and the pit cover block shall be installed before pressurization. If pressurization beyond that obtained from the tank farms water system or supply truck (i.e., approximately 150 pounds per square inch gauge) is necessary to remove blockage, an engineering evaluation shall be performed to determine the maximum allowable pressure for operation.

#### Excavation:

Excavation may be required to support installation of ventilation, electrical support and waste transfer equipment. Modifications to existing in route pits, vaults and piping and/or to support installation of new waste transfer lines from the 244-CR Facility to the identified DST may require excavation. Soil excavation activities will be performed in accordance with ALARACT Demonstration 5, TWRS ALARACT Demonstration for Soil Excavation (Using Hand Tools), and will follow the radiological controls specified in that ALARACT.

Any Guzzler excavations in contamination areas will be performed in accordance with the December 18, 1998, WDOH approved Site Wide Guzzler NOC (Air 98-1215), or the most current NOC approved for Guzzler use. Excavation of contaminated soils using heavy equipment shall follow the requirement of Site Wide Guzzler NOC.

Soil excavation outside the tank farm fence also may be performed with heavy equipment.

Soil will be excavated around the 244-CR vault facility to install new piping, equipment slabs, and new waste transfer system support equipment. It is expected that about 1,000 cubic yards may be excavated, with about 600 cubic yards from inside the tank farm. Backfill shall be from the original removed soil or non-contaminated controlled density fill (sand, water and a small amount of cement).

Current power within the 244-CR Vault Facility is limited. To provide power for new equipment installed under the project, the existing power distribution system shall be upgraded. Upgrades shall involve modification to the existing Motor Control Center (MCC), installation of equipment control panels, and installation of new conduits.

A compliant passive breather filter shall be installed to ventilate the 244-CR Facility vaults and tanks once waste transfer activities are completed. The passive breather filters shall be installed at two locations in the 244-CR facility. A 1,000 cfm HEPA filter shall be installed at the air inlet assembly (previously attached to the evaporative cooler) and a 160 cfm HEPA filter shall be installed upstream of the existing HEPA filter pit. Butterfly valves in the ventilation system just downstream of where the filters shall be installed can be shut to prevent any emission from the facility during filter installation. Installation of the filters shall be performed in accordance with ALARACT Demonstration 16, TWRS ALARACT Demonstration for Work on Potentially Contaminated Ventilation System Components.

During waste transfer and support activities the tank and vault air space shall be actively ventilated by a temporary ventilation system. The temporary ventilation system shall consist of a portable exhaustor that shall be equipped with compliant monitoring and sampling equipment. The purpose of the exhaustor is to ensure potential airborne contamination from the pits, cells, or process tanks, is not being released to the environment. Operation of the 1,000 cfm portable exhaustor is considered an emissions control.

New waste transfer system, waste staging/consolidation.

The planned transfer system can utilize some existing equipment along with installation of new piping and equipment at 244-CR, ER-153 and/or 244-A Lift Station. Maintenance of the transfer system may be required during the waste staging/consolidation. Equipment, which may require on going maintenance includes but is not limited to leak detection and pump system equipment. The waste can be staged/consolidated in one or two of the 244-CR Facility tanks (CR-001, CR-002, CR-003 and CR-011) prior to transfer to a DST.

The following controls are used for the pit activities:

#### General Controls:

1. Pre-job and post-job radiation surveys are performed by radiation protection technicians. Radiation work permits specify permissible occupational radiological limits during activities. Radiation control technicians' survey and release equipment, inspect and approve required containment, and provide radiological surveys to verify compliance to radiation work permit limits.
2. Pit work is shut down (or not initiated) when sustained wind speeds exceed 25 miles per hour as measured in the field and/or reported by the Hanford Meteorological Station.

3. Fixatives shall be applied inside the pit (with cover blocks on or off) or accessible portions of the pit decontaminated to less than 100,000 disintegrations per minute/100 square centimeters beta-gamma and 2,000 disintegrations per minute/100 square centimeters alpha.

4. When cover blocks are removed, a fall protection handrail is installed. This handrail is draped in plastic forming a contamination barrier. The plastic extends to the top of the pit and is taped or sealed at the top of the pit. Decontamination of the containment barrier is conducted as required by the job specific radiation work permit.

5. Radiation control technicians monitor the affected work area when the vault foam covering is removed, when jumpers and equipment are being removed from risers and nozzles, and when risers are entered for sampling of tanks and sumps. Jumpers removed from the pit are drained of free liquid and decontaminated or contained before removal. The outer-most container shall not exceed 1,000 disintegrations per minute/100 square centimeters beta/gamma and 20 disintegrations per minute/100 square centimeters alpha. If these limits are exceeded, surfaces shall be decontaminated. Disposition of non reusable equipment waste shall be performed in accordance with ALARACT Demonstration 4, TWRS ALARACT Demonstration for packaging and transportation of waste.

6. A bullpen designed to minimize the top opening shall be used. Pit covers or cover blocks will be removed as necessary. If the bullpen is to be left unattended at any time, a temporary cover is placed over the pit or the pit covers or cover blocks are reinstalled. Two tents shall be erected over two pits. Upon completion of the work in the first two 244-CR Facility instrumentation pits, the tents will be relocated to the other 244-CR facility instrumentation pits.

7. PTRAEU(s) shall actively ventilate the bullpens during activities that require work in the pits (after removal of the cover blocks) to control radiological releases. The PTRAEU(s) shall operate intermittently and shall be operated in accordance with the latest revision to the WDOH approved, Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).

8. A compliant exhauster skid shall ventilate the process cells and tanks during waste transfer activities. The exhauster shall maintain a negative pressure under the cover blocks and prevent contaminants from reaching the environment. The exhauster skid shall be connected to the existing exhaust ductwork with rigid or flexible ductwork.

9. The 1,000 cfm exhauster shall be equipped with a two-stage HEPA filter, which meets the requirements of ASME AG-1, Section FC and shall be tested annually to requirements of ASME N510. The HEPA filters shall have an efficiency of 99.95 percent for 0.3-micron median diameter. Each filter housing shall meet the applicable sections of ASME N509 and the test requirement of ASME N510. The exhaust stack houses a Generic Effluent Monitoring System (GEMS) that contains an air velocity probe and the air sampling probe.

10. The breather filter shall consist of a housing that contains a HEPA filter, an outlet screen, and a small seal loop. Air flowing to and from the 244-CR Facility shall pass horizontally through the filter and vertically through the downward-facing exit weather hood. Seal loops, installed in the exhaust lines, are designed as a safety feature to prevent unlikely accident in which an over pressurization occurs when the HEPA filter is isolated for occasional (infrequent) maintenance.

Specific Controls include:

-Installation of portable 1,000 cfm exhauster shall use ALARACT 16.

- Removal and/or installation of vault foam covering - ALARACT 4.
- Application of fixative at pit interior - see General Controls.
- Temporary power installation - ALARA.
- Operation of PTRAEU for bullpen ventilation - Latest WDOH approval, AIR 99-1102, for the Portable/Temporary Radioactive Air Emission Unit (PTRAEU) NOC (DOE/RL-96-75).
- Removal and/or installation of pit covers - General Controls.
- Inspection of pits, vaults, and tanks - General Controls.
- Removal and disposition of excess equipment and waste in pits, risers, and tanks - ALARACT 15, and ALARACT 4.
- Decontamination activities - General Controls.
- Measurement of liquid level and sludge levels in tanks and sumps - General Controls.
- Sampling activities in pits, vaults, and tanks including chemical addition and/or waste sampling to determine Double Shell Tank waste acceptance - ALARACT 7 and ALARACT 1.
- Facility Equipment Activities: installation, disconnection, repair, replacement, and/or leak testing, of new and existing facility equipment (valves, jumpers, pumps, leak detectors, or other instrumentation/equipment) - ALARACT 4, and ALARACT 15.
- Modifications, maintenance, and/or isolation and sealing of existing in route pits, vaults and piping (drain and transfer lines) to support and/or installation of new transfer lines - General Controls.
- Excavation - ALARACT 5, and/or WDOH approved Site Wide Guzzler NOC (Air 98-1215), or the most current NOC approved for Guzzler use.
- Installation of permanent power to 244-CR Vault Facility - ALARA.
- Installation of passive breather filter assembly - ALARACT 16.
- Operation of a portable exhauster at 244-CR vault for ventilation - ALARA.
- New waste transfer system, waste staging/consolidation - General Controls.

**4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Ac - 227	6.86E-06	Am - 241	3.13E-03	Am - 243	3.96E-05
Ba - 137 m	6.41E+03	C - 14	3.82E-02	Cd - 113 m	1.99E-02
Cm - 242	8.48E-05	Cm - 243	5.01E-04	Cm - 244	9.49E-03
Co - 60	1.31E-03	Cs - 134	4.22E-04	Cs - 137	5.78E+03
Eu - 152	5.31E-02	Eu - 154	7.09E+00	Eu - 155	1.22E+01

H - 3	3.57E-01	I - 129	6.95E-05	Nb - 93	m	8.10E-03
Ni - 59	1.88E-01	Ni - 63	1.82E+01	Np - 237		1.75E-01
Pa - 231	3.19E-07	Pu - 238	1.75E-01	Pu - 239		7.01E+00
Pu - 240	1.02E+00	Pu - 241	3.66E+00	Pu - 242		8.89E+00
Ra - 226	5.30E-06	Ra - 228	4.68E-05	Ru - 106		1.28E-06
Sb - 125	1.80E-03	Se - 79	1.88E-02	Sm - 151		6.55E+00
Sn - 126	2.69E-03	Sr - 90	3.02E+04	Tc - 99		1.63E+00
Th - 229	3.11E-06	Th - 232	3.53E-05	U - 232		2.61E-03
U - 233	1.01E-02	U - 234	1.72E-01	U - 235		7.61E-03
U - 236	1.95E-03	U - 238	5.05E-03	Y - 90		3.02E+04
Zr - 93	6.85E-03					

- 5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- 7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 10) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable



standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

- 17) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)), (WAC 246-247-080(6))

- 18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
- 21) The filter shall be tested in-place annually to the requirements of ASME N510 and have an efficiency of 99.95 percent.

**DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR**

**PROJECT TITLE: INSTALLATION AND OPERATION OF WASTE RETRIEVAL SYSTEMS IN  
SINGLE-SHELL TANK (SST) 241-S-112**

Emission Unit Name: 296-P-43

Emission Unit ID 57

This is a MAJOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]  
BARCT [WAC 246-247-040(3)]

<u>Zone or Area:</u>	<u>Abatement Technology</u>	<u>Required # of Units</u>	<u>Additional Description/Conditions</u>
	Prefilter	1	
	Heater	1	
	HEPA	2	HEPAs in series
	Fan	1	
	Demister	1	

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

<u>Federal and State Regulatory</u>	<u>Monitoring and Testing Procedure</u>	<u>Radionuclides Requiring Measurement</u>	<u>Sampling Frequency</u>
40 CFR 61.93(b)(4)(i) & WAC 246-247-075(3)	Appendix B, Method 114(3)	All radionuclides which could contribute 10% of the potential EDE.	Continuous

Sampling Requirements: Continuous during emission unit operation.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

02/28/2003 NOC, (DCE/RL-2002-62 Revision 0) received November 15, 2002. Approved on February 28, 2003 via AIR 03-209.

07/09/2003 Revision to change demister to optional has been signed. No new conditions and limitations mailed.

03/31/2004 NOC revision, Revision 2, received March 31, 2004 to change demister from optional to required and to provide clarification of injection of 180 degree Fahrenheit water down the pump dilution leg into the saltcake to help dissolve the waste and perform waste minimization for the DST system. Conditions and Limitations, AIR 04-406, mailed on April 15, 2004.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 3.90E-02 mrem/year to the

Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 7.51E+01 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).

- 3) **This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in WAC 246-247-030(16), may be conducted.**

The Salt Cake Dissolution Retrieval Demonstration Project in SST 241-S-112 uses water that is introduced in a controlled fashion to dissolve and mobilize solids in the tank. The resulting solution is then pumped and transferred to the Double-Shell Tank (DST) system. A portable exhauster will provide active ventilation for some dissolution activities and all waste transfer activities until structural safety considerations force shutdown, at which time passive ventilation shall be used.

The following activities will be performed :

#### Pit

- a. Opening the 241-S-112 Condenser Pit to remove the old cover plate and install a new cover plate to allow for the connection of a HEPA filter to the exhauster trunk for a portable exhauster.
- b. Enter 241-S-C Valve Pit to disconnect the existing 241-S-112 HIHTL.
- c. Enter the 241-S-109 Valve Pit to remove the existing HIHTL that is no longer needed.
- d. Accessing the 241-S-112A Central Pump Pit to:
  - Install an instrument manifold,
  - Install a transfer pump, and
  - Replacement of the existing HIHTL that is not needed for this project with a new HIHTL.
- e. Enter the 241-S-A Valve Pit to:
  - Connect the hose-in-hose transfer line (HIHTL) from the 241-S-112 Tank to the DST receiver tank, and
  - Install the leak detection hardware.

Pit work shall be performed in accordance with ALARACT 6 "TWRS ALARACT Demonstration for Pit Access" and ALARACT 14 "TWRS ALARACT Demonstration for Pit Work".

#### Soil Excavation

- a. Excavation of soil inside the tank farm for the installation of an electrical and instrumentation conduit to monitor transfer progress.
- b. Excavation of soil outside the tank farm for conduit and transformer installation.
- c. Excavation of Soil inside the tank farm for installation of a new raw water header installed between the 241-SY Tank Farm and the 241-S Tank Farm to the 241-S-112 Tank.
- d. Installation of a HIHTL to convey waste from Tank 241-S-112 to the DST transfer system.

Soil excavation shall be performed in accordance with ALARACT 5 "TWRS ALARACT Demonstration for Soil Excavation (using hand tools)".

#### In-Tank Equipment

- a. Installation of various motor controlled spray devices into (3) risers near the outside perimeter of the tank and an automatic indexing spray device will be installed on a centrally located riser.
- b. Remove Liquid Observation Well (LOW).
- c. Installation of Stilwell (Level Monitoring Device protection).

Work shall be performed in accordance with ALARACT 1 "TWRS ALARACT Demonstration for Riser Preparation/Opening" and ALARACT 13 "TWRS ALARACT Demonstration for Installation, Operation and Removal of Tank Equipment".

#### Water Addition/ Dilution

- Installation of a new heat traced and insulated raw water line installed between the 241-S Tank Farm and the 241-SY Tank Farm to the water distribution skid on top of Tank 241-S-112.

Water addition and dilution for salt-cake dissolution shall use portable exhausters for active ventilation when water addition flow rate is above 80 gallons per minute, at less than 80 gallons per minute salt cake dissolution shall use either a breather HEPA filter for passive ventilation, or active ventilation.

#### Waste Transfer

- Installation of a progressive cavity pump and supporting equipment to recover and transport waste from Tank 241-S-112 to the DST System.

Waste transfer activities shall use portable exhausters for active ventilation until structural safety considerations force shutdown, at which time passive ventilation shall be used.

The major components of the exhauster are; stack, glycol heaters, 1 pre-filter, 2 HEPA filters, 1 exhaust fan, sampling system and a demister which is determined to be optional.

#### Other

- Removal of the Standard Hydrogen Monitoring Probe.

#### 4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):

Ac - 227	6.12E-03	Am - 241	7.24E+01	Am - 243	7.60E+01
Ba - 137 m	2.14E+05	C - 14	3.59E+01	Cd - 109	2.26E+02
Cm - 242	1.14E-02	Cm - 243	5.63E-01	Cm - 244	1.35E+01
Co - 60	6.47E+01	Cs - 134	5.68E-01	Cs - 137	2.26E+05
Eu - 152	1.02E+01	Eu - 154	2.05E+02	Eu - 155	1.96E+02
H - 3	3.08E+02	I - 129	8.43E-01	Nb - 93 m	5.09E+01
Ni - 59	1.08E+01	Ni - 63	9.97E+02	Np - 237	1.56E+00
Pa - 231	1.59E-02	Pu - 238	8.10E+00	Pu - 239	6.08E+01
Pu - 240	9.36E+00	Pu - 241	5.78E+01	Pu - 242	4.16E-04
Ra - 226	5.98E-04	Ra - 228	8.46E-02	Ru - 106	1.84E-04
Sb - 125	1.01E+02	Se - 79	1.73E+00	Sm - 151	4.27E+04
Sn - 126	7.73E+00	Sr - 90	1.07E+05	Tc - 99	2.47E+02

Th - 229	4.50E-03	Th - 232	1.35E-03	U - 232	2.78E-01
U - 233	7.11E+00	U - 234	4.65E+00	U - 235	2.01E-02
U - 236	2.51E-02	U - 238	4.52E-01	Y - 90	1.07E+05
Zr - 93	6.26E+01				

- 5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- 6) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 7) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 8) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
- 9) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 10) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 11) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

- 12) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 13) Radiological monitoring shall be performed in accordance with the latest revision of HNF-5183, Tank Farms Radiological Control Manual.
- 14) Equipment removal and monitoring (pre and post-job surveys) shall be performed in accordance with ALARACT 13; equipment disposition shall be performed in accordance with ALARACT 4 and 15.

- 15) The Annual Possession Quantity and Potential-to-Emit to the MEI shall be tracked on a WDOH approved log.
- 16) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- 17) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 19) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 20) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart II (WAC 246-247-080(2)).
- 21) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).
- 22) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 23) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
- 24) The emission unit monitoring system shall have the following activities performed:
  - a. The USDOE shall provide to WDOH for review copies of the procedures used to perform the functional/calibration checks and visual inspection activities;
  - b. A functional/calibration check of the monitoring system instrumentation shall be performed annually.

Within two years of the original approval, ATR 03-209, dated February 28, 2003:

- c. A visual check of nozzle position and orientation as well as measurements of nozzle openings;
- d. Checks to ensure the tightness of all fittings and connections as well as a leak test of the entire sampling system;
- e. Visual inspections for corrosion, physical damage, or dust loading of the probe, sample lines, and

monitoring system  
· equipment.

- 25) The exhauster shall consist of 2 HEPA filters in the portable exhauster. Each HEPA filter shall be individually tested, annually, to the requirements of ASME N510, and shall have a minimum efficiency of 99.95%.
- 26) All facilities with licensed emission units, except for radioactive materials licensees, shall submit a request to the department for renewal of their radioactive air emissions license at least sixty days prior to expiration of the license or as required by the Air Operating Permit. All renewal requests shall include a summary of the operational status of all emission units, the status of facility compliance with the standards of WAC 246-247-040, and the status of any corrective actions necessary to achieve compliance with the requirements of this chapter. Facilities with licensed emission units that also hold a radioactive materials license issued by the department shall submit this information along with their radioactive material license renewal submittal. If the department is unable to renew a radioactive air emissions license before its expiration date, the existing license, with all of its requirements and limitations, remains in force until the department either renews or revokes the license (WAC 246-247-060(9)).
- 27) All radioactive air emissions licenses issued by the department, except those issued to radioactive materials licensees, shall have an expiration date of five years from date of issuance or as specified in the Air Operating Permit. For radioactive material licensees, the requirements and limitations for the operation of emission units shall be incorporated into their radioactive materials license, and shall expire when the radioactive materials license expires (WAC 246-247-060(6)).

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

**PROJECT TITLE: INSTALLATION AND OPERATION OF WASTE RETRIEVAL SYSTEMS IN  
SINGLE-SHELL TANK (SST) 241-S-112**

Emission Unit Name: 241-S-112

Emission Unit ID 203

This is a MINOR, PASSIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: ALARACT

ALARACT [WAC 246-247-040(4)]  
BARCT [WAC 246-247-040(3)]

<u>Zone or Area:</u>	<u>Abatement Technology</u>	<u>Required # of Units</u>	<u>Additional Description/Conditions</u>
Tank 241-S-112	HEPA	1	Single Passive HEPA Filter

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

<u>Federal and State Regulatory</u>	<u>Monitoring and Testing Procedure</u>	<u>Radionuclides Requiring Measurement</u>	<u>Sampling Frequency</u>
40 CFR 61.93(h)(4)(i) & WAC 246-247-075(2)	Appendix B, Method 114(3)	TOTAL ALPHA TOTAL BETA	Annual
<b>Sampling Requirements:</b> PCM will be a smear survey on the inside surface of the ducting and downstream of the HEPA filter or on the outside of the screen covering the outlet of the vent.			

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.**Change History**

02/28/2003 NOC, (DOE/RL-2002-62 Revision 0) received November 15, 2002. Approved on February 28, 2003 via AIR 03-209

07/09/2003 Revision to change demister to optional has been signed. No new conditions and limitations mailed.

03/31/2004 NOC revision, Revision 2, received March 31, 2004 to change demister from optional to required and to provide clarification of injection of 180 degree Fahrenheit water down the pump dilution leg into the saltcake to help dissolve the waste and perform waste minimization for the DST system. Conditions and Limitations, AIR 04-406, mailed on April 15, 2004.

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 3.90E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 7.51E+01 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).



- 3) **This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in WAC 246-247-030(16), may be conducted.**

The Salt Cake Dissolution Retrieval Demonstration Project in SST 241-S-112 uses water that is introduced in a controlled fashion to dissolve and mobilize solids in the tank. The resulting solution is then pumped and transferred to the Double-Shell Tank (DST) system. A portable exhauster will provide active ventilation for some dissolution activities and all waste transfer activities until structural safety considerations force shutdown, at which time passive ventilation shall be used.

The following activities will be performed :

#### Pit

- a. Opening the 241-S-112 Condenser Pit to remove the old cover plate and install a new cover plate to allow for the connection of a HEPA filter to the exhauster trunk for a portable exhauster.
- b. Enter 241-S-C Valve Pit to disconnect the existing 241-S-112 HHHTL.
- c. Enter the 241-S-109 Valve Pit to remove the existing HHHTL that is no longer needed.
- d. Accessing the 241-S-112A Central Pump Pit to:
  - Install an instrument manifold,
  - Install a transfer pump, and
  - Replacement of the existing HHHTL that is not needed for this project with a new HHHTL.
- e. Enter the 241-S-A Valve Pit to:
  - Connect the hose-in-hose transfer line (HHHTL) from the 241-S-112 Tank to the DST receiver tank, and
  - Install the leak detection hardware.

Pit work shall be performed in accordance with ALARACT 6 "TWRS ALARACT Demonstration for Pit Access" and ALARACT 14 "TWRS ALARACT Demonstration for Pit Work".

#### Soil Excavation

- a. Excavation of soil inside the tank farm for the installation of an electrical and instrumentation conduit to monitor transfer progress.
- b. Excavation of soil outside the tank farm for conduit and transformer installation.
- c. Excavation of Soil inside the tank farm for installation of a new raw water header installed between the 241-SY Tank Farm and the 241-S Tank Farm to the 241-S-112 Tank.
- d. Installation of a HHHTL to convey waste from Tank 241-S-112 to the DST transfer system.

Soil excavation shall be performed in accordance with ALARACT 5 "TWRS ALARACT Demonstration for Soil Excavation (using hand tools)".

#### In-Tank Equipment

- a. Installation of various motor controlled spray devices into (3) risers near the outside perimeter of the tank and an automatic indexing spray device will be installed on a centrally located riser.

- b. Remove Liquid Observation Well (LOW).
- c. Installation of Stilwell (Level Monitoring Device protection).

Work shall be performed in accordance with ALARACT 1 "TWRS ALARACT Demonstration for Riser Preparation/Opening" and ALARACT 13 "TWRS ALARACT Demonstration for Installation, Operation and Removal of Tank Equipment".

#### Water Addition/ Dilution

- Installation of a new heat traced and insulated raw water line installed between the 241-S Tank Farm and the 241-SY Tank Farm to the water distribution skid on top of Tank 241-S-112.

Water addition and dilution for salt-cake dissolution shall use portable exhausters for active ventilation when water addition flow rate is above 80 gallons per minute, at less than 80 gallons per minute salt cake dissolution shall use either a breather HEPA filter for passive ventilation, or active ventilation.

#### Waste Transfer

- Installation of a progressive cavity pump and supporting equipment to recover and transport waste from Tank 241-S-112 to the DST System.

Waste transfer activities shall use portable exhausters for active ventilation until structural safety considerations force shutdown, at which time passive ventilation shall be used.

The major components of the exhauster are; stack, glycol heaters, 1 pre-filter, 2 HEPA filters, 1 exhaust fan, sampling system and a demister which is determined to be optional.

#### Other

- Removal of the Standard Hydrogen Monitoring Probe.

#### 4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):

Ac - 227	6.12E-03	Am - 241	7.24E+01	Am - 243	7.60E+01
Ba - 137 m	2.14E+05	C - 14	3.59E+01	Cd - 113 m	2.26E+02
Cm - 242	1.14E-02	Cm - 243	5.63E-01	Cm - 244	1.35E+01
Co - 60	6.47E+01	Cs - 134	5.68E-01	Cs - 137	2.26E+05
Eu - 152	1.02E+01	Eu - 154	2.05E+02	Eu - 155	1.96E+02
H - 3	3.08E+02	I - 129	8.43E-01	Nb - 93 m	5.09E+01
Ni - 59	1.08E+01	Ni - 63	9.97E+02	Np - 237	1.56E+00
Pa - 231	1.59E-02	Pu - 238	8.10E+00	Pu - 239	6.08E+01
Pu - 240	9.36E+00	Pu - 241	5.78E+01	Pu - 242	4.16E-04
Ra - 226	5.98E-04	Ra - 228	8.46E-02	Ru - 106	1.84E-04
Sb - 125	1.01E+02	Se - 79	1.73E+00	Sm - 151	4.27E+04
Sn - 126	7.73E+00	Sr - 90	1.07E+05	Tc - 99	2.47E+02
Th - 229	4.50E-03	Th - 232	1.35E-03	U - 232	2.78E-01
U - 233	7.11E+00	U - 234	4.65E+00	U - 235	2.01E-02
U - 236	2.51E-02	U - 238	4.52E-01	Y - 90	1.07E+05

- 5) The radionuclides in Condition 4, Annual Possession Quantity are limited to the physical forms of liquid or particulate solid.
- 6) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- 7) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- 8) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 9) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 10) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- 11) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 12) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
- 13) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 14) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 15) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 16) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 17) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).
- 18) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

- 19) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 20) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 21) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
- 22) Radiological monitoring shall be performed in accordance with the latest revision of HNF-5183, Tank Farms Radiological Control Manual.
- 23) Pre and post-job surveys shall be made in accordance with ALARACT(s) 5, 6 and 13 during pit work activities, soil excavation activities, and for equipment removal and/ or installation.
- 24) The Annual Possession Quantity and Potential-to-Emit to the MEI shall be tracked on a WDOH approved log.
- 25) When the portable exhauster is not in use the tank shall be ventilated through the passive breather filter consisting of a single HEPA filter. Each HEPA filter shall be individually tested, annually, to the requirements of ASME NS10, and shall have a minimum efficiency of 99.95%.
- 26) Diffuse/Fugitive emissions shall be monitored using the 200 Area near-field ambient air monitors. Sample collection and analysis shall follow that of the near field monitoring program. Analytical results shall be reported in the Annual Air Emissions Report. Any change to this near-field ambient monitoring program must be approved by the department.
- 27) All radioactive air emissions licenses issued by the department, except those issued to radioactive materials licensees, shall have an expiration date of five years from date of issuance or as specified in the Air Operating Permit. For radioactive material licensees, the requirements and limitations for the operation of emission units shall be incorporated into their radioactive materials license, and shall expire when the radioactive materials license expires (WAC 246-247-060(6)).

- 28) All facilities with licensed emission units, except for radioactive materials licensees, shall submit a request to the department for renewal of their radioactive air emissions license at least sixty days prior to expiration of the license or as required by the Air Operating Permit. All renewal requests shall include a summary of the operational status of all emission units, the status of facility compliance with the standards of WAC 246-247-040, and the status of any corrective actions necessary to achieve compliance with the requirements of this chapter. Facilities with licensed emission units that also hold a radioactive materials license issued by the department shall submit this information along with their radioactive material license renewal submittal. If the department is unable to renew a radioactive air emissions license before its expiration date, the existing license, with all of its requirements and limitations, remains in force until the department either renews or revokes the license (WAC 246-247-060(9)).

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

**PROJECT TITLE: INSTALLATION AND OPERATION OF WASTE RETRIEVAL SYSTEMS IN  
SINGLE-SHELL TANK (SST) 241-S-112**

Emission Unit Name: 200 AREA DIFFUSE/FUGITIVE

Emission Unit ID 486

This is a MAJOR, FUGITIVE, non-point source emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]

BARCT [WAC 246-247-040(3)]

<u>Zone or Area:</u>	<u>Abatement Technology</u>	<u>Required # of Units</u>	<u>Additional Description/Conditions</u>
	Excavation Restriction		Abatement controls as required in the following Conditions and Limitations.
	Fixatives (paint, water, dust suppressants)		Abatement controls as required in the following Conditions and Limitations.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

<u>Federal and State Regulatory</u>	<u>Monitoring and Testing Procedure</u>	<u>Radionuclides Requiring Measurement</u>	<u>Sampling Frequency</u>
WAC 246-247-075[3]	Appendix B, Method 114	All radionuclides which could contribute 10% of the potential TEDE.	As listed in the following Conditions and Limitations.

**Sampling Requirements:** Existing near-facility monitoring stations.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

02/28/2003 NOC, (DOE/RL-2002-62 Revision 0) received November 15, 2002. Approved on February 28, 2003 via AIR 03-209.

07/09/2003 Revision to change demister to optional has been signed. No new conditions and limitations mailed.

03/31/2004 NOC revision, Revision 2, received March 31, 2004 to change demister from optional to required and to provide clarification of injection of 180 degree Fahrenheit water down the pump dilution leg into the saltcake to help dissolve the waste and perform waste minimization for the UST system. Conditions and Limitations, AIR 04-406, mailed on April 15, 2004

**CONDITIONS AND LIMITATIONS**

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 3.90E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 7.51E+01 mrem/year to the Maximally Exposed Individual

(WAC 246-247-030(21)).

- 3) **This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in WAC 246-247-030(16), may be conducted.**

The Salt Cake Dissolution Retrieval Demonstration Project in SST 241-S-112 uses water that is introduced in a controlled fashion to dissolve and mobilize solids in the tank. The resulting solution is then pumped and transferred to the Double-Shell Tank (DST) system. A portable exhaustor will provide active ventilation for some dissolution activities and all waste transfer activities until structural safety considerations force shutdown, at which time passive ventilation shall be used.

The following activities will be performed :

#### Pit

- a. Opening the 241-S-112 Condenser Pit to remove the old cover plate and install a new cover plate to allow for the connection of a HEPA filter to the exhaustor trunk for a portable exhaustor.
- b. Enter 241-S-C Valve Pit to disconnect the existing 241-S-112 HIHTL.
- c. Enter the 241-S-109 Valve Pit to remove the existing HIHTL that is no longer needed.
- d. Accessing the 241-S-112A Central Pump Pit to:
  - Install an instrument manifold,
  - Install a transfer pump, and
  - Replacement of the existing HIHTL that is not needed for this project with a new HIHTL.
- e. Enter the 241-S-A Valve Pit to:
  - Connect the hose-in-hose transfer line (HIHTL) from the 241-S-112 Tank to the DST receiver tank, and
  - Install the leak detection hardware.

Pit work shall be performed in accordance with ALARACT 6 "TWRS ALARACT Demonstration for Pit Access" and ALARACT 14 "TWRS ALARACT Demonstration for Pit Work".

#### Soil Excavation

- a. Excavation of soil inside the tank farm for the installation of an electrical and instrumentation conduit to monitor transfer progress.
- b. Excavation of soil outside the tank farm for conduit and transformer installation.
- c. Excavation of Soil inside the tank farm for installation of a new raw water header installed between the 241-SY Tank Farm and the 241-S Tank Farm to the 241-S-112 Tank.
- d. Installation of a HIHTL to convey waste from Tank 241-S-112 to the DST transfer system.

Soil excavation shall be performed in accordance with ALARACT 5 "TWRS ALARACT Demonstration for Soil Excavation (using hand tools)".

#### In-Tank Equipment

- a. Installation of various motor controlled spray devices into (3) risers near the outside perimeter of the tank and an automatic indexing spray device will be installed on a

- centrally located riser.
- b. Remove Liquid Observation Well (LOW).
- c. Installation of Stilwell (Level Monitoring Device protection).

Work shall be performed in accordance with ALARACT 1 "TWRS ALARACT Demonstration for Riser Preparation/Opening" and ALARACT 13 "TWRS ALARACT Demonstration for Installation, Operation and Removal of Tank Equipment".

#### Water Addition/ Dilution

- Installation of a new heat traced and insulated raw water line installed between the 241-S Tank Farm and the 241-SY Tank Farm to the water distribution skid on top of Tank 241-S-112.

Water addition and dilution for salt-cake dissolution shall use portable exhausters for active ventilation when water addition flow rate is above 80 gallons per minute, at less than 80 gallons per minute salt cake dissolution shall use either a breather HEPA filter for passive ventilation, or active ventilation.

#### Waste Transfer

- Installation of a progressive cavity pump and supporting equipment to recover and transport waste from Tank 241-S-112 to the DST System.

Waste transfer activities shall use portable exhausters for active ventilation until structural safety considerations force shutdown, at which time passive ventilation shall be used.

The major components of the exhauster are; stack, glycol heaters, 1 pre-filter, 2 HEPA filters, 1 exhaust fan, sampling system and a demister which is determined to be optional.

#### Other

- Removal of the Standard Hydrogen Monitoring Probe.

#### 4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):

Alpha - 0	2.68E-02	Beta - 0	2.60E-01	Cs - 139	1.45E-05
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- 5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).
- 6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
- 7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision



for such testing (WAC 246-247-075(9) and (10)).

- 10) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
- 12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart II (WAC 246-247-080(2)).
- 15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).
- 17) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6)).

- 18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts,

and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

- 20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
- 21) Diffuse/Fugitive emissions shall be monitored using the 200 Area near-field ambient air monitors. Sample collection and analysis shall follow that of the near field monitoring program. Analytical results shall be reported in the Annual Air Emissions Report. Any change to this near-field ambient monitoring program must be approved by the department.
- 22) Pit work and monitoring (pre and post-job surveys) shall be performed in accordance with ALARACT 6 and 14; packaging and transportation of waste shall be performed in accordance with ALARACT 14.
- 23) Soil excavation activities and monitoring (pre and post-job surveys) shall be performed in accordance with ALARACT 5. Not more than 2000 cubic feet of soil shall be removed. The disturbed soil shall not leave the 241-S Tank Farm area.
- 24) Equipment removal and monitoring (pre and post-job surveys) shall be performed in accordance with ALARACT 13; equipment disposition shall be performed in accordance with ALARACT 4 and 15.
- 25) The Annual Possession Quantity and Potential-to-Emit to the MIEI shall be tracked on a WDOH approved log.
- 26) All facilities with licensed emission units, except for radioactive materials licensees, shall submit a request to the department for renewal of their radioactive air emissions license at least sixty days prior to expiration of the license or as required by the Air Operating Permit. All renewal requests shall include a summary of the operational status of all emission units, the status of facility compliance with the standards of WAC 246-247-040, and the status of any corrective actions necessary to achieve compliance with the requirements of this chapter. Facilities with licensed emission units that also hold a radioactive materials license issued by the department shall submit this information along with their radioactive material license renewal submittal. If the department is unable to renew a radioactive air emissions license before its expiration date, the existing license, with all of its requirements and limitations, remains in force until the department either renews or revokes the license (WAC 246-247-060(9)).
- 27) All radioactive air emissions licenses issued by the department, except those issued to radioactive materials licensees, shall have an expiration date of five years from date of issuance or as specified in the Air Operating Permit. For radioactive material licensees, the requirements and limitations for the operation of emission units shall be incorporated into their radioactive materials license, and shall expire when the radioactive materials license expires (WAC 246-247-060(6)).

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

**PROJECT TITLE: CONDUCTING GENERAL LABORATORY PROCESSES RESEARCH  
ACTIVITIES IN THE 325 BUILDING**

Emission Unit Name: EP-325-01-S

Emission Unit ID 361

This is a MAJOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: ALARACT

ALARACT [WAC 246-247-040(4)]

BARCT [WAC 246-247-040(3)]

<u>Zone or Area:</u>	<u>Abatement Technology</u>	<u>Required # of Units</u>	<u>Additional Description/Conditions</u>
	HEPA	2	2 in series
	Fan	3	4 in parallel (3 operational, 1 backup)

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

<u>Federal and State Regulatory</u>	<u>Monitoring and Testing Procedure</u>	<u>Radionuclides Requiring Measurement</u>	<u>Sampling Frequency</u>
40 CFR 61.93(b)(4) & WAC 246-247-75(2)	Method 2 Appendix A; Appendix B, Method 114	All radionuclides that contribute greater than 10 percent of the potential-to- emit TEDE to the MEI, greater than 0.1 mrem/yr potential-to-emit TEDE to the MEI, and greater than 25 percent of the TEDE to the MEI after controls.	Particulates are continuously sampled and collected every two-weeks for gross alpha and gross beta analysis, and composited on a semi-annual basis and analyzed isotopically. Tritium samples are collected on a monthly basis for analysis.

**Sampling Requirements:** Continuous particulate using filter and tritium using silica gel.**Additional** monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.**Change History**

12/31/2002 Notice of Construction Application for the Radiochemical Processing Laboratory (325 Building) received November 15, 2002; approved via AIR 02-1256 dated December 31, 2002. This application obsoleted the following NOC IDs: 127, 159, 253, 294, 302, 430, 447, 491 which were associated with the following: AIR 02-808 issued on August 20, 2002, approved the Tritium Target Qualification Program; AIR 02-809 issued on August 22, 2002, approved the 325 Building Hazardous Waste Treatment Unit (HWTU); Short Form issued on January 19, 1998, approved the Transfer of Strontium-90 from the 324 Building to the 325 Building; AIR 98-604 issued June 7, 1998, approved 325 Building LLW Vitrification Research and AIR 98-807 issued August 20, 1998, approved the Modification to the Annual Possession Quantity of the 325 Building Special Nuclear Materials Disposition and Low-Level Waste Vitrification Research Programs (Pu-238); Short Form issued on January 14, 1995, approved the Removal of 3rd Stage HEPA Filter, 325 Building; AIR 02-206 issued on February 13, 2002, approved the Medical Isotope Research Using Th-232 (full scale processing); AIR 02-102 issued on January 7, 2002, approved the I-131 Medical Isotope Research in the Radiochemical Processing Laboratory.

09/12/2003 Conditions and Limitations, AIR 03-1106, mailed on November 17, 2003 to reflect current appeal language agreed upon on September 12, 2003. Faxed acceptance received on December 8, 2003.

01/15/2004 NOC revision, Revision 1, received January 15, 2004 and approved via AIR 04-209 dated February 23, 2004.

## CONDITIONS AND LIMITATIONS

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 3.19E+00 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)).
- 3) **This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in WAC 246-247-030(16), may be conducted.**

Approved are the following laboratory activities conducted in the RPI:

- Characterizing chemical, radiochemical, and physical properties of samples (e.g., tank wastes, spent fuel, contaminated soils and water), as well as other gaseous materials, glass, ceramic, carbonaceous, or metallic waste forms.
- Performing research using high-level and low-level mixed tank wastes and their stimulants to test radiochemical process systems such as leaching, solvent extraction, ion exchange, vitrification, fuel dissolution, decontamination, evaporation, grouting, solid waste packaging/shipment, and high-level liquid waste shipping/receiving/transportation.
- Performing research and development for processing and immobilization support including waste separation, ion exchange, sludge washing/leaching, ultrafiltration, and oxidation/precipitation. Separated species are then immobilized into vitreous and other waste forms, which are subsequently characterized for product acceptability.
- Using a full suite of analytical capabilities for radiochemical and inorganic chemical analyses in support of process development, specializing in the analysis of highly radioactive materials and very complex sample matrices.
- Pretreatment of materials in preparation for analytical processing, waste treatment, and characterization.
- Developing methods for the separation of radioisotopes.
- Developing and testing radioisotope generators.
- Conducting Non-destructive assay (NDA).
- Characterizing and testing equipment for determining chemical and physical properties of spent nuclear fuels and associated materials to support processing and disposal pathways.
- Performing reactor dosimetry and hydrogen and helium measurements to characterize radiation damage in materials.
- Using instrumentation to conduct physical property measurement for rheological and chemical characterization of radiological and hazardous materials in support of process development.
- Measuring material particle size and density, zeta potential and rheology in support of general research as well as process development.
- Providing chemical and physical separations in support of radiological and hazardous material processing and disposal requirements. These technologies include: removal and concentration of hazardous and/or radioactive components for environmental remediation; separation of hazardous and/or radioactive materials, including solid/liquid phase separations; and, recovery of specific components for recycle and reuse.
- Characterizing complex reactor environments, including neutron fluence and spectral measurements, hydrogen and helium gas measurements, and extensive computer simulations of radiation damage effects.

- Developing thermal and vitrification processes to immobilize hazardous and radioactive materials into acceptable waste forms. Waste processing technology development includes design, process development, remote operations, and numerical and computational modeling.
- Performing nuclear magnetic resonance methods designed for investigation of radioactive materials in the environment, radioactive tank waste, plutonium bearing materials, and other DOE mission active areas as well as fundamental studies of actinide metal salts.
- Designing, installing, and testing radiochemical process systems (leaching, solvent extraction, ion exchange, vitrification, fuel dissolution, decontamination, evaporation, grouting, solid waste packaging and shipment, and high-level liquid waste shipping, receiving, and transportation).
- Using thermoanalytical instrumentation to measure reaction enthalpies, reaction kinetics and mass changes resulting from reactions, and determining the thermal sensitivity of the reaction.
- Perform analysis of reaction off-gases on a real-time or end-of-reaction basis to identify and quantify the gaseous reaction products, and investigate the thermal stabilities of candidate radioisotope waste forms, volatile radioisotope trapping materials and the potentially hazardous reactions between radioactive waste constituents.
- Separations and analyses of radionuclides for environmental measurements.
- Performing research with supercritical fluids to understand chemistry mechanisms and processes.
- Conducting wet chemistry techniques and the operation of specialized analytical instrumentation such as mass spectrometers, organic mass spectrometers, and the Inductively Coupled Plasma Spectrometers.
- Studies to decontaminate radioactive materials where metals may be hydrided or tritiated and decontaminated in small electric furnaces in gloveboxes or fumehoods resulting in products (e.g., oxide materials) submitted for disposal.
- Research and development in processing and method to harden radioactive sources.
- Development of standards and testing methodologies for hardened radioactive sources.
- Analysis of samples for impurities and analysis of samples for purity.

The RPL also is approved to maintain two hot cell complexes for conducting work with highly radioactive materials. The High Level Radiochemistry Facility (HLRF) and Shielded Analytical Laboratory (SAL) hot cell complexes, and the stand alone mini-cells, provide unique, complimentary capabilities for conducting bench-scale to pilot-scale work with wide varieties and forms of radioactive materials. These capabilities include: radiochemical separation and purification; irradiated fuel/target sectioning and processing; metallography and ceramography; activated metals physical properties testing; thermal processing; materials physical properties testing (solid/liquid separation, centrifugation, settling behavior); radioanalytical and preparatory chemistry operations (acid dissolution, aqueous/solvent extraction or leaching, distillation, ion exchange, caustic fusion).

Additional approval of the process for this activity is contained in the following Conditions/Limitations.

- 4) The PTE for this project as determined under WAC 246-247-030(21)(a-e) [as specified in the application] is 2.09E+04 mrem/year. Approved are the associated potential release rates (Curies/year) of:

Ac - 225	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Ac - 227	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		

Ac - 228		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ag - 108		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ag - 108	m	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ag - 109	m	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ag - 110		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ag - 110	m	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ag - 111		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Al - 26		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Al - 28		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Am - 241	3.50E+00	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Am - 242		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Am - 242	m	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Am - 243	5.40E-03	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Am - 245		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ar - 37		Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ar - 39		Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ar - 41		Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ar - 42		Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
As - 74		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			







Ce - 139		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ce - 141		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ce - 142		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ce - 143		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ce - 144		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cf - 249		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cf - 250		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cf - 251		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ct - 252	1.20E-01	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Cl - 36		Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cm - 241		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cm - 242		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cm - 243		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cm - 244	1.00E+00	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Cm - 245		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cm - 246		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cm - 247		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cm - 248		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Co - 56		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			

Co - 57		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Co - 58		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Co - 60	1.60E+02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Cr - 51		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cr - 55		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cs - 131		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cs - 134		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cs - 134	m	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cs - 135		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cs - 136		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cs - 137	1.70E+02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Cs - 138		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cs - 139		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Cu - 64		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Es - 254		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Eu - 150		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Eu - 152		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Eu - 152	m	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Eu - 154	2.00E+02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Eu - 156	4.90E+03	Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Eu	- 156		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Eu	- 157		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
F	- 18		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Fe	- 55		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Fe	59		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Fr	- 221		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Fr	223		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Ga	- 67		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Ga	- 72		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Gd	- 148		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Gd	- 149		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Gd	- 151		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Gd	- 152		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Gd	- 153		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Ge	- 68		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
H	- 3	3.00E+03	Gas	WAC 246-247-030(21)(a)
H	- 3	1.30E+05	Gas	WAC 246-247-030(21)(a)
H	- 3		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Hf	- 175		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				







Nd - 144	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Nd - 147	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Ni - 56	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Ni - 59	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Ni - 63	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Ni - 65	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Np - 235	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Np - 236	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Np 237	3.60E+00 Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Np 238	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Np - 239	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Np - 240	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Np 240 m	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
O - 15	Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
P - 32	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
P - 33	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Pa - 231	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Pa - 233	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		
Pa - 234	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.		





Po - 212		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Po - 213		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Po - 214		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Po - 215		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Po - 216		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Po - 218		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Pr - 143		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Pr - 144		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Pr - 144 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Pu - 234		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Pu - 236		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Pu - 237		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Pu - 238	5.70E+00	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Pu - 239	5.50E+01	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Pu - 240	3.40E-02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Pu - 241	3.20E+02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Pu - 242	5.20E-03	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Pu - 243		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Pu - 244		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ra - 223		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			





Sm - 147		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Sm - 151	5.40E+04	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Sm - 153		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Sm - 157		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Sn - 113		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Sn - 117	m	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Sn - 119	m	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Sn - 121	m	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Sn - 123		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Sn - 125		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Sn - 126		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Sr - 85		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Sr - 89		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Sr - 90	3.60E+02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Sr - 91		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Sr - 92		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ta - 179		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ta - 182		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ta - 183	1.70E+02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)



Te - 132		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Te - 133		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Te - 133	m	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Te - 134		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Th - 227		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Th - 228	7.40E-03	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Th - 229		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Th - 230		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Th - 231		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Th - 232	4.40E+00	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Th - 233		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Th - 234		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ti - 44		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ti - 51		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ti - 204		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ti - 207		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ti - 208		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ti - 209		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Tm - 170		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			

Tm	- 171		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
U	- 232	5.50E-03	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
U	- 233	1.30E-02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
U	234	1.40E-02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
U	235	3.10E+01	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
U	- 236	1.40E-02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
U	- 237		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
U	- 238	6.10E+01	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
U	- 239		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
U	- 240		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
V	- 48		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
V	- 49		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
W	- 181		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
W	- 185		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
W	- 187		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
W	188	1.70E+02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Xe	- 122		Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Xe	- 123		Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Xe	- 125		Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				
Xe	- 127		Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.				

Xe - 131	m	Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Xe - 133		Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Xe - 133	m	Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Xe - 135		Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Xe - 135	m	Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Xe - 137		Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Xe - 138		Gas	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Y - 88		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Y - 90	1.20E+05	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Y - 90	m	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Y - 91		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Y - 91	m	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Y - 92		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Y - 93		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Yb - 164		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Yb - 175		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Yb - 177		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Zn - 65		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Zn - 69		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			



Zn - 69	m	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Zr - 88		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Zr - 89		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Zr - 93		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Zr - 95		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			

The radioactive isotopes identified for this emission unit are (no quantities specified):

Ac 225		Ac 227		Ac-228	
Ag 108	m	Ag 108		Ag-109	m
Ag 110	m	Ag 110		Ag-111	
Al 26		Al 28		Am-241	
Am 242	m	Am 242		Am-243	
Am 245		Ar 37		Ar 39	
Ar 41		Ar 42		As 74	
As 76		At 217		Au 195	
Au 198		Ba 131		Ba 133	
Ba 133	m	Ba 137	m	Ba 139	
Ba 140		Ba 141		Ba 142	
Be 10		Be 7		Bi 207	
Bi 210		Bi 211		Bi 212	
Bi 213		Bi 214		Bk 249	
Bk 250		Br 82		Br 83	
Br 84		Br 85		C 11	
C 14		C 15		Ca 41	
Ca 45		Ca 47		Cd 109	
Cd 113	m	Cd 113		Cd 115	m
Cd 115		Ce 139		Ce 141	
Ce 142		Ce 143		Ce 144	
Cf 249		Cf 250		Cf 251	
Cf 252		Cl 36		Cm 241	
Cm 242		Cm 243		Cm 244	
Cm 245		Cm 246		Cm 247	
Cm 248		Co 56		Co 57	
Co 58		Co 60		Cr 51	
Cr 55		Cs 131		Cs 134	
Cs 134	m	Cs 135		Cs 136	
Cs 137		Cs 138		Cs 139	
Cu 64		Es 254		Eu 150	

Eu 152  
 Eu 155  
 F -18  
 Fr 221  
 Ga 72  
 Gd 151  
 Ge -68  
 Hf -178  
 Hf -182  
 Ho -166 m  
 I -125  
 I -131  
 I 134  
 In -113 m  
 In 115  
 K 40  
 Kr 83 m  
 Kr -87  
 Kr 90  
 La 141  
 Mg -27  
 Mn -56  
 N -13  
 Nb -91  
 Nb -93 m  
 Nb -95 m  
 Nd -144  
 Ni -59  
 Np -235  
 Np -238  
 Np 240 m  
 P -33  
 Pa -234  
 Pb -210  
 Pb -214  
 Pm -145  
 Pm -148 m  
 Pm 151  
 Po -210  
 Po -213  
 Po -216  
 Pr -144  
 Pu 236  
 Pu -239  
 Pu -242  
 Ra -223

Eu -152 m  
 Eu -156  
 Fe -55  
 Fr -223  
 Gd -148  
 Gd -152  
 H -3  
 Hf -178 m  
 Hg -203  
 I 122  
 I -129  
 I -132  
 I -135  
 In -114 m  
 In -115 m  
 K 42  
 Kr -85  
 Kr -88  
 La -138  
 La -142  
 Mn -52  
 Mo 93  
 Na -22  
 Nb -91 m  
 Nb -94  
 Nb -97  
 Nd 147  
 Ni -63  
 Np -236  
 Np -239  
 O 15  
 Pa 231  
 Pa -234 m  
 Pb -211  
 Pd 107  
 Pm 146  
 Pm -148  
 Po 208  
 Po -211  
 Po -214  
 Po 218  
 Pr -144 m  
 Pu -237  
 Pu 240  
 Pu -243  
 Ra 224

Eu -154  
 Eu -157  
 Fe -59  
 Ga -67  
 Gd -149  
 Gd -153  
 Hf 175  
 Hf -181  
 Ho -166  
 I -123  
 I -130  
 I -133  
 In 106  
 In -114  
 Ir -192  
 Kr -81  
 Kr -85 m  
 Kr -89  
 La -140  
 Lu -177  
 Mn -54  
 Mo -99  
 Na 24  
 Nb -92  
 Nb -95  
 Nb -97 m  
 Ni -56  
 Ni -65  
 Np -237  
 Np -240  
 P -32  
 Pa -233  
 Pb -209  
 Pb -212  
 Pd -109  
 Pm -147  
 Pm -149  
 Po -209  
 Po -212  
 Po -215  
 Pr -143  
 Pu -234  
 Pu -238  
 Pu -241  
 Pu -244  
 Ra -225

Ra -226	
Rb -87	
Rb -90	
Re -187	
Rh -103	m
Rh -106	
Rn 222	
Ru -106	
Sb -124	
Sb -126	m
Sc -47	
Si -31	
Sm -147	
Sm -157	
Sn -119	m
Sn -125	
Sr -89	
Sr -92	
Ta -183	
Tc -95	m
Tc 98	
Te -121	m
Te -123	m
Te -127	
Te -131	
Te -133	
Th -227	
Th -230	
Th 233	
Ti -51	
Tl 208	
Tm -171	
U -234	
U -237	
U -240	
W -181	
W -188	
Xe 125	
Xe -133	
Xe -135	m
Y -88	
Y -91	
Y -93	
Yb 177	
Zn 69	m
Zr -93	

Ra 228	
Rb -88	
Rb 90	m
Re 188	
Rh 105	
Rn 219	
Ru -103	
Ru -97	
Sb -125	
Sb -127	
Se -75	
Sm -145	
Sm 151	
Sn -113	
Sn -121	m
Sn -126	
Sr 90	
Ta -179	
Tb -160	
Tc 97	
Tc 99	
Te -121	
Te 125	m
Te 129	m
Te -131	m
Te -133	m
Th -228	
Th -231	
Th -234	
Tl -204	
Tl 209	
U -232	
U -235	
U 238	
V -48	
W -185	
Xe -122	
Xe -127	
Xe 133	m
Xe -137	
Y -90	
Y -91	m
Yb -164	
Zn -65	
Zr -88	
Zr -95	

Rb 86	
Rb 89	
Re -186	
Rh -102	
Rh -105	m
Rn -220	
Ru -105	
S -35	
Sb -126	
Sc -46	
Se 79	
Sm 146	
Sm -153	
Sn -117	m
Sn 123	
Sr -85	
Sr -91	
Ta -182	
Tc 101	
Tc -97	m
Tc 99	m
Te 123	
Te -127	m
Te -129	
Te 132	
Te -134	
Th -229	
Th -232	
Ti -44	
Tl -207	
Tm 170	
U 233	
U 236	
U -239	
V -49	
W -187	
Xe -123	
Xe 131	m
Xe -135	
Xe -138	
Y -90	m
Y -92	
Yb -175	
Zn -69	
Zr 89	

The potential release rates described in this Condition were used to determine control technologies and monitoring requirements for this approval. DOE must notify the Department of a "modification" to the emission unit, as defined in WAC 246-247-030(16). DOE must notify the Department of any changes to a NESILAP major emission unit when a specific isotope is newly identified as contributing greater than 10% of the potential TEDE to the MEL, or greater than 25% of the TEDE to the MEL after controls. WAC 246-247-110(9). DOE must notify the Department of any changes to potential release rates as required by state or federal regulations including changes that would constitute a significant modification to the Air Operating Permit under WAC 173-401-725(4). Notice will be provided according to the particular regulation under which notification is required. If the applicable regulation(s) does not address manner and type of notification, DOE will provide the Department with advance written notice by letter or electronic mail but not solely by copies of documents.

5) For the Th-232 Medical Isotope:

The Rn-220 gas that is generated during the process will be routed through a recovery system that is located inside of a hood in Room 510. As the Rn-220 (gaseous form) decays (55 second half-life), the resulting daughter products shall be collected in the recovery system. The recovery system shall be capable of collecting in excess of 80% of the Rn-220 that is generated.

6) For the Th-232 medical isotope project:

Before initiation of processing, the Rn-220 monitor shall be operational. The exhaust sample will be measured by a Rn-220 monitor collected using the same isokinetic probe that is used to collect the record particulate sample. The radon monitor shall be installed downstream of the record particulate sample, measuring the sample stream that has already been pre-filtered by the record particulate sample.

7) For the Th-232 Medical Isotope Project:

Procedures for Rn-220 monitoring shall be forwarded to the department for review.

8) For the I-131 Medical Isotope Project:

Iodine samples shall be collected using a two-stage sample collection system. The sampling system shall consist of a 47mm in-line filter holder that contains either a removable activated carbon canister or filter paper coated with activated carbon. Two samplers shall be placed in series to evaluate potential breakthrough of the first sampling stage. The iodine samplers shall be installed on the current stack sampling system for RPL, downstream of the record particulate sampler. The iodine samples shall be analyzed using EPA Method G-1 (40 CFR 61, Appendix B).

9) For the I-131 Medical Isotope Project:

The iodine sampling system shall be in continuous operation when the I-131 material for this project enters the RPL facility through completion of the project (when all iodine has been processed and shipped for offsite use).

10) For the I-131 Medical Isotope Project:

The exhaust from the hot cell shall be routed through an activated charcoal bed. A charcoal bed shall be procured and installed upstream of the HEPA filters. The filter assembly shall be a two-stage filter, containing a charcoal bed and a post-filter inside of the same outer housing. The post-filter shall be a particulate filter designed to remove any carbon particles that may dislodge from the bed from normal use, preventing these particles from reaching the primary and secondary stages of HEPA filtration downstream.

11) For the I-131 Medical Isotope Project:

The removal efficiency for radio-iodine of the charcoal bed filter unit shall be a minimum of 90% and shall be installed and tested per ANSI 510. These procedures shall be developed in accordance with the guidance provided in ANSI N510. These procedures shall be provided to the department for review prior to starting the I-131 project.

12) For the I-131 Medical Isotope Project

The charcoal bed shall be rated at a minimum of 1,000 cubic feet per minute (cfm) and be 2" thick.

13) For the Tritium Target Qualification Project (TTQP)

Sectioning of the TPBAR rods shall be performed in the hot cells in HLRF. Sectioning must be done inside Plexiglas containment.

14) For the Tritium Target Qualification Project (TTQP):

The tritium permeation testing shall be conducted in Room 48 of the basement in the laboratory hood or glovebox.

15) For the Tritium Target Qualification Project (TTQP):

The "Mandatory Use Procedures" require that each step be read prior to performing the activity.

These procedures are those that involve the following:

- \* Operation of the furnace and gas clean-up system used to extract tritium from the Tritium Producing Burnable Absorber Rods  
and;
- \* The transfer of the extracted tritium to hydride transport vessels.

16) TTQP Project Specific Emission Control Systems

Molecular Sieve

A molecular sieve will be used to control emissions during the full-rod tritium extraction process to be performed in the HLRF.

The molecular sieve will be used until the exhaust gas concentration, as measured with an ion chamber, indicates that the sieve is approaching the point of breakthrough. At this point, a fresh molecular sieve bed will replace the spent bed.

#### Two-Stage Bubbler Trap

The tritium emission control system for the small-scale extraction activities in Laboratory 416 consists of a two-stage bubbler-type trapping system. The bubbler-type trapping system includes a glass tube that contains either water or oil. An inert sweep gas carries the tritium from the heated tritium target rod components to the bubbler where tritium is removed from the gas stream.

#### Uranium Getter

Cladding material permeability measurements during Activity 3 will use a uranium getter material as a part of the commercial tritium storage system.

#### 17) For the Tritium Target Qualification Project (TTQP):

Project activities are limited to High Level Radiochemical Facility (HLRF), Shielded Analytical Laboratory (SAL), and Rooms 420, 418, and Room 48 in the basement.

#### 18) This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in (WAC 246-247-030(16)), may be conducted.

#### Tritium Target Qualification Project (TTQP)

Tritium Target Qualification Project (TTQP) it is approved to perform the analysis of ten tritium-producing, burnable absorber rods (target rods) that were shipped to the RPL from the Idaho National Engineering Laboratory and eight additional target rods shipped from the Argonne National Laboratory West (ANL-W) to the RPL.

The processes approved under this activity includes the following:

**Target Rod Sectioning (Activity 1)** - Sections are cut from the tritium target rods for quantitative analysis using a diamond saw within a Plexiglas containment. Each section is disassembled, and the components are analyzed to determine gas-species concentrations. Selected sections are further analyzed for lithium burn-up, as well as tritium and helium content. The rods are then subjected to protium, metallography, and microprobe studies. During the sectioning of the rods, emissions from the hot cells of the High-Level Radiochemistry Facility (HLRF) are vented to the existing radiological exhaust system and eventually to the main exhaust stack.

**Tritium Extraction and Analysis (Activity 2)** - Tritium is extracted by heating either a 4-foot target rod, or components from the target rod sections. Following tritium extraction, the 4-foot target rod is sectioned and analyzed as described in Activity 1. Tritium extraction and analysis is performed at two separate locations within the Radiochemical Processing Laboratory (RPL). Small-scale tritium extraction tests are performed in Room 416, while full tritium-rod extraction tests are conducted in the hot cells of the HLRF. Radionuclide emissions not captured during the tritium extraction tests pass

through a laboratory hood or glovebox to the existing ventilation system, and eventually through the main exhaust stack.

Ex-reactor Tritium Permeation Tests (Activity 3) - Measurements are taken to determine the cladding material permeability used in the target rods. The test is conducted in an enclosed test loop, of which a section is constructed from TARGET ROD cladding material. Tritium absorption/release kinetics validation, correlation development and hydrogen ingress characterization, safety testing, and mechanical testing are then conducted. The tritium permeation tests are performed in Laboratory 48 in the RPL basement. Preparation of lithium aluminate ( $\text{LiAlO}_2$ ) samples for lithium isotopic ratio analysis is conducted in Laboratory 419. Radionuclide emissions not captured during the permeation tests are allowed to pass through a laboratory hood or glovebox, to the existing ventilation system, and eventually through the main exhaust stack.

Other activities that will continue with the "ramp down" of the TTQP include clean-up of the furnace and other portions of the extraction system and subsequent waste disposal. During these activities, minor tritium releases are expected from hold-up within the system.

- 19) This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in (WAC 246-247-030(16)), may be conducted.

#### MEDICAL ISOTOPE RESEARCH (Th-232 Project)

Th-232 parent material is approved to be present in the facility as either an oxide [ $\text{ThO}_2$ ] or a nitrate [ $\text{Th}(\text{NO}_3)_4$ ]. The parent material shall be maintained in shipping containers, with sub-samples being periodically removed for performing laboratory testing. During the tests, the parent material may be subjected to processes (e.g., grinding or suspension in solution) to maximize the recovery of the desired isotopes. The preparation of the parent material and the capture process shall be performed in Room 510. The amount of parent material allowed to be processed annually under this NOC is estimated to be 30,000 kilograms. Parent material may be transported to RPL from off-site suppliers in multiple shipments throughout the year. The parent material shall be in the form of a granular oxide or nitrate (powder) that will be stored inside shipping containers at RPL until it is to be used. The shipping containers will be opened periodically to retrieve parent material for processing.

The prepared materials will then be loaded into a containment vessel and the vessel sealed. A transport line has been tapped into the lid of the containment vessel. The Rn-220 gas that is generated during batch processing exits the vessel through this transport line to a radon recovery system that is located inside of a laboratory hood in Room 510. The daughter products that result from the decay of Rn-220 are captured by the recovery system, and this system exhausts to a laboratory fume hood that is part of the RPL radiological exhaust system. The exhaust exits the facility through the RPL main stack (EP-325-01-S).

The radionuclides associated with this project are the Th-232 in the parent material, and the daughter products resulting from the decay of Th-232 (in order): Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Po-212, Tl-208, and Pb-208 (stable isotope).

- 20) This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in (WAC 246-

247-030(16)), may be conducted.

#### MEDICAL ISOTOPE RESEARCH (I-131 Project)

I-131 solution will be procured from an offsite vendor and shipped to the Pacific Northwest National Laboratory (PNNL). It is expected that multiple shipments of I-131 will be required throughout the project, due to storage concerns that are the result of the short half-life of I-131 (approximately eight days). The objective of these experiments is to combine the I-131 solution with an antibody solution (supplied by the customer). The test apparatus is a closed system that shall be set up inside of a hot cell located in Room 203 of the RPL.

One containment vessel (medical grade - intravenous type bag) shall be used for the I-131 solution, and the second vessel shall be used to contain the vendor-supplied antibody solution. Both solutions shall be transported to the mixing vessel by means of a peristaltic pump. The mixed solution will then be routed through an in-line purification system and dispensed into a medical grade product bag. Once processing is complete, the I-131 antibody shall be transferred from the product bag into small glass vials (inside the hot cell). The final product can then be shipped to the customer or a destination designated by the customer. Shipment from RPL must occur fairly quickly, due to the short half-life of I-131.

Processing will be performed using variable amounts of I-131 and will be conducted as separate batches. Current project is allowed to conduct multiple processing runs, with each run using from four to 100 curies (Ci) of I-131. The processing of the material will not alter the physical form of the I-131 liquid. No more than 300 Ci of I-131 per year is allowed.

- 21) This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in (WAC 246-247-030(16)), may be conducted.

#### WASTE OPERATIONS

The approved activities in the Radiochemical Processing Laboratory (RPL) include waste treatment operations that occur in various areas of the facility. In the HWTU, hazardous materials and radioactive mixed waste shall be stored, dispensed, used, handled, packaged in drums, and treated using various small bench-scale treatment processes. Treatment processes used at the HWTU is limited to include pH adjustment, ion exchange, venting of gas cylinders, carbon absorption using polymer beads or mineral absorbents such as clays, chemical oxidation, chemical precipitation, chemical reduction, waste concentration by evaporation, neutralization, filtration, solvent extraction, solids washing, catalytic destruction, and grout encapsulation (cementation).

The compaction unit is allowed to reduce volumes of low-level radioactive and radioactive-mixed dry materials (such as gloves, wipes, and step-off pad waste). During each compaction event, radiological smear samples shall be collected to verify containment of radiological contamination.

Radioactive waste boxes and drums are allowed to be stored in a controlled, fenced area (outside of the RPL) at the northeast corner of the facility. If any intrusive work (i.e., sampling, etc.) is required that may have the potential to emit radionuclides, the container shall be moved inside the facility.



- 22) **This condition was obsoleted on 9/12/2003.** These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).

*Condition/Limitation added via AIR 02-1256. Obsoleted by appeal language agreed upon on September 12, 2003.*

- 23) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-040(5)) and WAC 246-247-060(5)).
- 24) The facility shall notify the department at least seven calendar days prior to any planned preoperational tests of new or modified emission units that involve emissions control, monitoring, or containment systems of the emission unit(s). The department reserves the right to witness or require preoperational tests involving the emissions control, monitoring, or containment systems of the emissions unit(s) (WAC 246-247-060(4)).
- 25) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).
- 26) **This condition was obsoleted on 2/3/2004.** The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
- Condition/Limitation added via AIR 02-1256. Obsoleted via AIR 04-209. Replaced by new standard conditions.*
- 27) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
- 28) All facilities must be able to demonstrate the reliability and accuracy of emissions monitoring data (WAC 246-247-075(13)).
- 29) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
- 30) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 31) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 32) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
- 33) The facility shall notify the department within twenty-four hours of any shutdown, or of any transient abnormal condition lasting more than four hours or other change in facility operations which, if allowed to persist, would result in emissions of radioactive material in excess of applicable standards

or license requirements (WAC 246-247-080(5)).

- 34) The facility shall file a report of closure with the department whenever operations producing emissions of radioactive material are permanently ceased at any emission unit (except temporary emission units) regulated under this chapter. The closure report shall indicate whether, despite cessation of operations, there is still a potential for radioactive air emissions and a need for an active or passive ventilation system with emission control and/or monitoring devices. If decommissioning is planned and will constitute a modification, a NOC is required, as applicable, in accordance with WAC 246-247-060. (WAC 246-247-080(6))
- 35) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
- 36) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).
- 37) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
- 38) Accidental releases with a probability of occurrence during the expected life of the emission unit of greater than one percent must be addressed. All such probable accidental releases shall be documented and supplied to the department upon request.
- 39) **This condition was obsoleted on 2/17/2004.** Within one year of this approval the emission unit monitoring system shall have the following activities performed:
- a. Inspect pitot tube systems for leaks, at least annually.
  - b. Inspect nozzles for alignment, presence of deposits, damage to sharp-edged nozzles, or other potentially degrading factors (corrosion, physical damage, etc) at least annually.
  - c. Check transport lines and if visible deposits are presents perform cleaning, at least annually.
  - d. Checks to ensure the tightness of all fittings and connections as well as a leak test of the sample system, at least annually.
  - e. Inspect rotameters of sampling systems for presence of foreign matter at the start of each sampling period.
  - f. A functional/calibration check of monitoring system instrumentation shall be performed at least annually.

*Condition/Limitation added via AIR 02-1256. Obsoleted via AIR 04-209. Replaced condition by requirement for the*

*sampling system to be commensurate with the Environmental Protection Agency requirements for monitoring.*

- 40) In addition to the isotopes approved under this NOC other radionuclides may be encountered. If a radionuclide not on this list is encountered, the department shall be notified and dose impacts shall be calculated.

41) For the Waste Sludge Solidification Demonstration:

The objective is to demonstrate methods of solidification of waste sludge from the 105 K East Basin. The purpose for rendering the sludge as a solid is to allow for permanent storage at the Waste Isolation Pilot Plant (WIPP).

Core samples are taken from sludge found in the K East Basin (up to 4 liters of solids) and transported to the 325 Building (RPL) for initial study. The samples are collected in 4-liter poly bottles and shipped to RPL in PAS-1 containers accompanied by a chain-of-custody. All containers shall be visually inspected upon receipt and dose measurements taken. After receipt, the sample bottles are placed into a glove box or hot cell and combined into one composite. The sludge is allowed to settle from the mixture, and the water is decanted. The decanted water and a sample of the settle sludge are characterized for major constituents (e.g. nucleotides, organics). The remaining sludge is split into different test samples and each processed with a different solidification method (grout, absorbent, drying, etc). Characterization of each test sample will occur at RPL, with the exception of one long term grout-solidified monolith prepared for long term and WIPP-specific testing at the Central Waste Center (CWC). Once testing is completed, a recommendation is made for the most effective solidification process.

Once the initial study is complete, large scale testing begins and will nominally include up to  $6.3 \text{ m}^3$  (the Spent Nuclear Fuel (SNF) project bounding volume is  $7.5 \text{ m}^3$ ) of sludge material. Material from the K East Basin is to be transported to the 325 Building using a Sludge Transport Systems (STS).

The STS consists of:

- Large Diameter Container (LDC). A vertical stainless steel cylindrical tank designed to contain material from K East Basin. The container is approximately 5 feet in diameter and 10 feet high.
- Sludge transportation cask. The LDC is placed into a cylindrical stainless steel and lead shell which is to provide shielding and to seal the LDC from the outside.
- Transportation trailer. The sludge transportation cask is anchored onto a trailer. The sludge transportation trailer complies with federal regulations and state standards.

Note: The following information is for completeness. Radioactive air emissions from these activities are covered by other permits/processes.

The STS is staged in the north transfer bay near the K East North Loading Operation Pit (NLOP). The LDC is connected to the K East Basin's Sludge Retrieval System (SRS), and is filled with material. Once a sufficient volume of sludge is contained in the LDC, the excess water cover level is lowered so the tank holds approximately  $2.5 \text{ m}^3$  of material. An inert gas (e.g., helium or argon) blanket is placed over the material inside the LDC and the tank's outlet and inlet ports are closed. A NucFil HEPA-type filter and rupture disk are placed on the tank's vent ports. The cask lid is then installed, sealing the LDC inside. Once the cask is sealed and secured, the STS is transported to the 325

Building loading dock by the High-Level Radiochemistry Facility (HLRF). Once the STS is staged in the desired location, the transportation cask is unsealed in an approved area.

Note: The following activities describe actions to be taken within the RPL.

Inside the building, the LDC inlet and outlet are opened and the material is sampled for analysis. After determining the acceptability of the material, it is pumped from the LDC into several shielded vessels. The materials in the vessels are then processed with the solidification method designated from the initial testing. Each vessel is covered with a lid vented with a NucFil HEPA-type filter. Each shield vessel is placed in an overpack container and stored inside the RPL until the material is ready for shipped to CWC. Once the LDC is emptied, it is rinsed. It is then placed back onto the STS in preparation for resealing in the transportation cask and for transport back to K Basin. Overall, three shipments of K East Basin sludge in the STS are planned at this time.

- 42) The dose impacts from the source term from all activities being performed at the 325 Building shall be assessed annually and shall be made available for review by the department upon request.
- 43) The sampling system shall be commensurate with the Environmental Protection Agency requirements for monitoring.
- 44) The department may conduct an environmental surveillance program to ensure that radiation doses to the public from emission units are in compliance with applicable standards. The department may require the operator of any emission unit to conduct stack sampling, ambient air monitoring, or other testing as necessary to demonstrate compliance with the standards in WAC 246-247-040. (WAC 246-247-075(9))
- 45) The department may require the owner or operator of an emission unit to make provision, at existing emission unit sampling stations, for the department to take split or collocated samples of the emissions. (WAC 246-247-075(10))
- 46) All facilities with licensed emission units, except for radioactive materials licensees, shall submit a request to the department for renewal of their radioactive air emissions license at least sixty days prior to expiration of the license or as required by the Air Operating Permit. All renewal requests shall include a summary of the operational status of all emission units, the status of facility compliance with the standards of WAC 246-247-040, and the status of any corrective actions necessary to achieve compliance with the requirements of this chapter. Facilities with licensed emission units that also hold a radioactive materials license issued by the department shall submit this information along with their radioactive material license renewal submittal. If the department is unable to renew a radioactive air emissions license before its expiration date, the existing license, with all of its requirements and limitations, remains in force until the department either renews or revokes the license (WAC 246-247-060(9)).
- 47) All radioactive air emissions licenses issued by the department, except those issued to radioactive materials licensees, shall have an expiration date of five years from date of issuance or as specified in the Air Operating Permit. For radioactive material licensees, the requirements and limitations for the operation of emission units shall be incorporated into their radioactive materials license, and shall

expire when the radioactive materials license expires (WAC 246-247-060(6)).